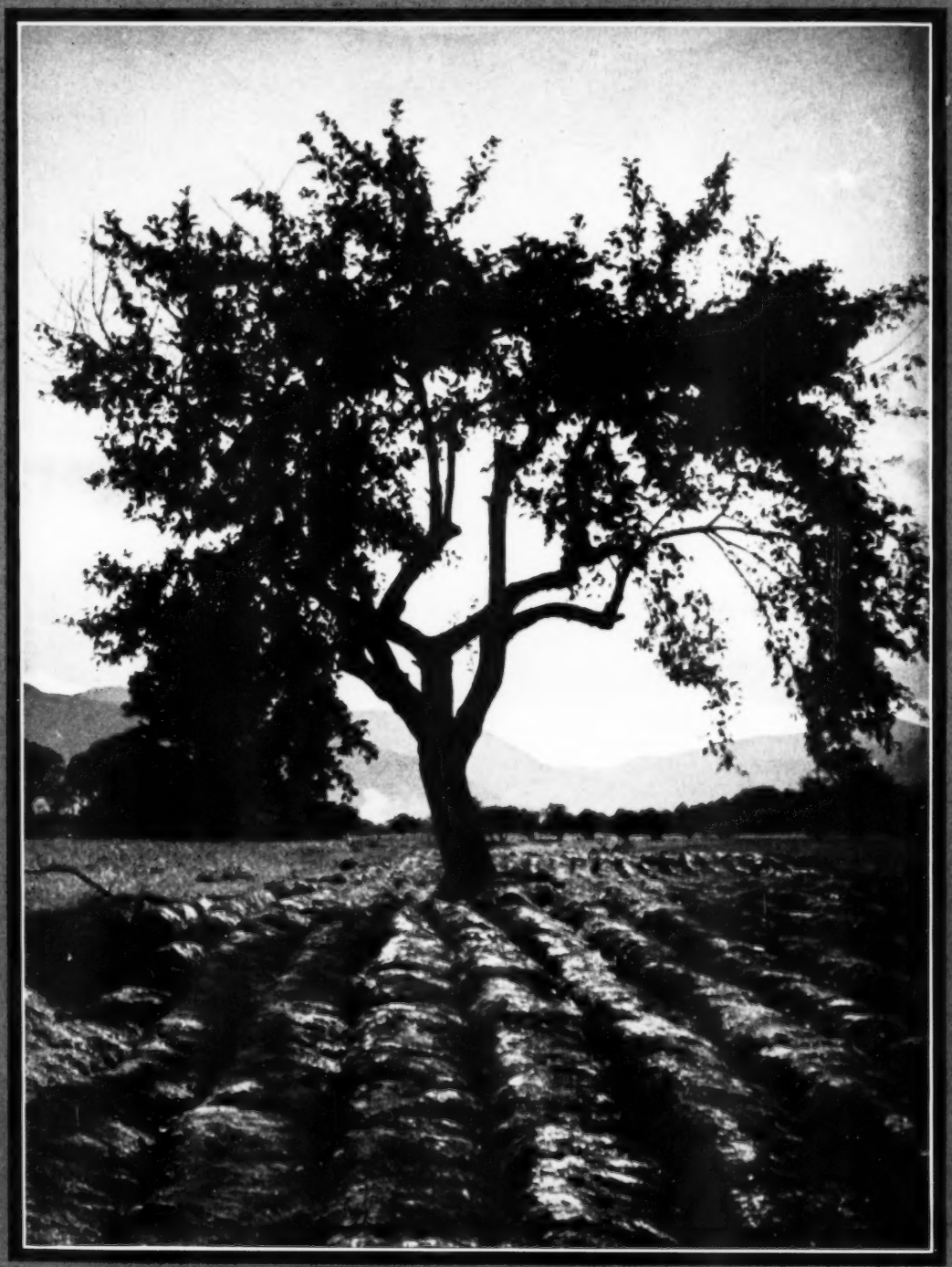
American FORESTS



MAY 1936

35 CENTS A COPY

"You can reach me by Telephone"

"YOU can reach me by telephone" . . . you say it casually, but there is assurance in your voice. For you can depend on telephone service. You call a number and a voice answers—across the street or across a continent. It's so easy to do — you have been doing it for years. Use has dimmed the wonder of the telephone.

Yet the wonder grows — there is no ending to telephone progress. Service is quicker, clearer and more accurate. Improvements are made each year. Things once thought impossible are now accomplished fact. Tomorrow will see still greater achievement.

That is the pioneering spirit of American enterprise. American initiative and American resourcefulness have given this country the best telephone service in the world.

Obviously this did not just happen. It has been brought about by the development of the Bell System over the past half-century. Time has proved the rightness of its plan of operation. Quick, dependable, universal service makes it possible for you to talk to almost every one, everywhere, and to say confidently — "You can reach me by telephone."

Ten years ago it took, on the average, 20 minutes to put through a long distance call between New York and San Francisco. Today it takes less than 2 minutes. The cost of a daytime station-to-station call between these points is now 45% less than in 1926.

BELL TELEPHONE SYSTEM

Entered as second-class matter at the Post-Office at Washington, D. C., under the act of March 3, 1879. Acceptable for mailing at special rate of postage provided in Section 1103, Act of October 3, 1917, authorized July 10, 1918. Additional Entry at Baltimore, Md., December 29, 1931.

Photograph by Ernest L. Crandall

Such a starved bank of moss
Till that May morn,
Blue ran the flash across—
Violets were born!
—Browning

AMERICAN FORESTS

VOLUME 42 — MAY, 1936 — NUMBER 5

CONTENTS

THE COVER
The Earth Awakens
Photograph by ELEANOR FISCHER, *made near Crawford Notch. New Hampshire State Award, 1933 Photographic Contest.*
"BLOSSOMS OF SPRING"
Photograph by THOMAS O. SHECKELL 202
SPRINGTIME
By GRIF ALEXANDER 203
THE CONTROL OF STREAM POLLUTION
By KENNETH A. REID 205
THE JEWELED FORESTS OF ARIZONA
By CRISTEL HASTINGS 208
HAS WILDLIFE A SENSE OF DIRECTION?
By CALVIN RUTSTRUM 211
EDITORIAL
"The Earth Disease" 213
PLANNING FIRE LOOKOUTS IN CALIFORNIA
By A. A. BROWN 214
THE OUTLOOK FOR THE WILD FLOWERS
By MRS. FRANCIS EDMUND WHITLEY 216
LOT'S WIFE LOOKED BACK
By SAM MIMS 218
SAVING THE SUGAR ORCHARD
By MARY CARPENTER KELLEY 221
FIELD AND FOREST FOR BOYS AND GIRLS
The Elm—America's Tree of Glory
By ERLE KAUFFMAN 222
PITCH PINE (Tree Series) 224
AROUND THE STATES 226
HOW EUROPEANS CONTROL MANAGEMENT OF WOODLANDS
By ARTHUR C. WEIDELICH 228
FORESTRY IN CONGRESS
By G. H. COLLINGWOOD 234
SAPLING SAM'S COLUMN 235
BOOK REVIEWS 236
THE CONSERVATION CALENDAR IN CONGRESS 238
ASK THE FORESTER 239
"WHO'S WHO" AMONG THE AUTHORS 248

OVID BUTLER
EDITOR

L. M. CROMELIN AND
ERLE KAUFFMAN
ASSISTANT EDITORS

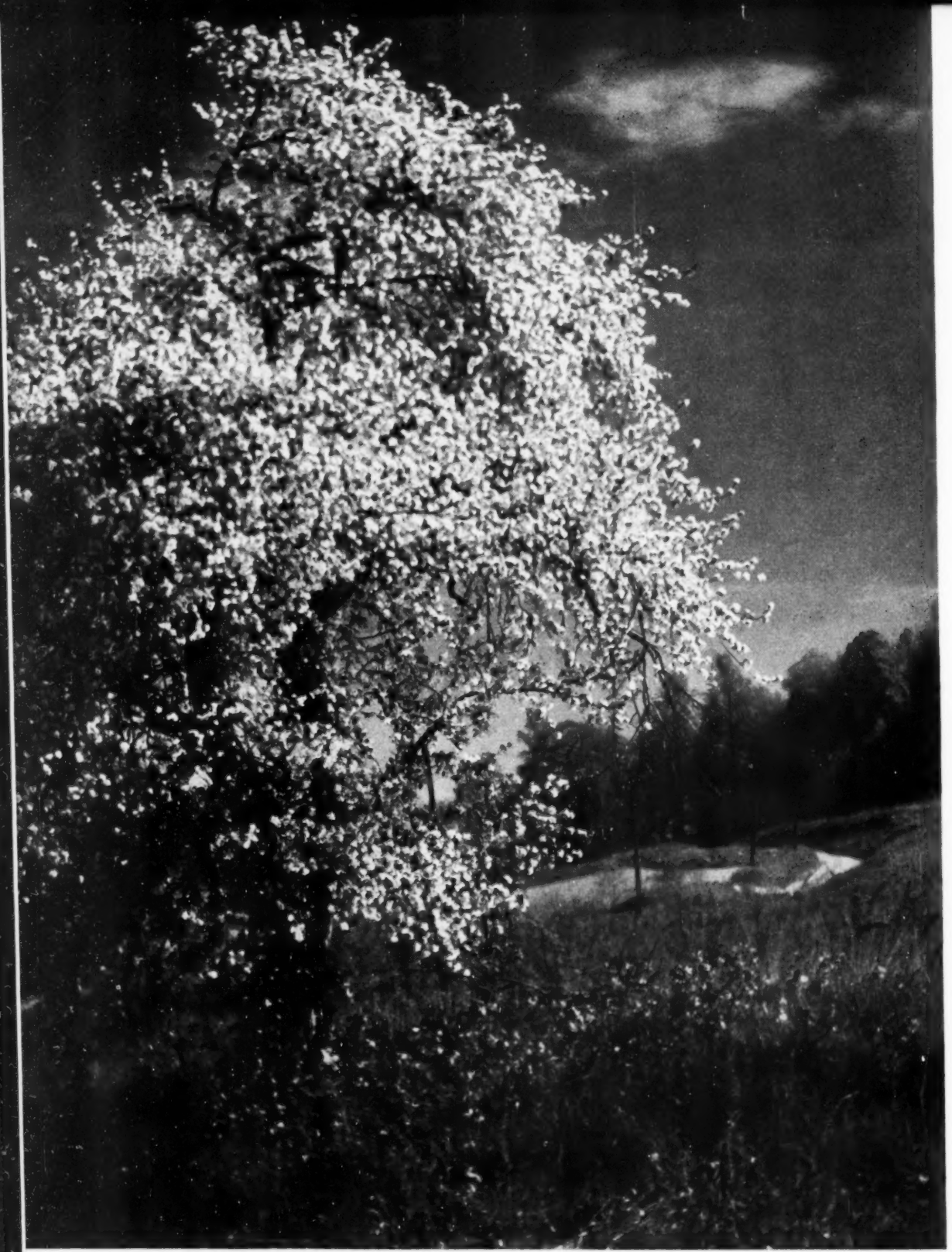
Published Monthly
by
THE AMERICAN FORESTRY ASSOCIATION
1713 K STREET, N. W.
WASHINGTON, D. C.

35 CENTS A COPY
$4.00 A YEAR

The Editors are glad to receive manuscripts and photographs submitted for publication, but they do so only with the understanding that they shall not be responsible for loss or injury thereto while in their possession or in transit. All manuscripts and art material should be accompanied by return postage. The Editors are not responsible for views expressed in signed articles . . . . Notice of change of address should be received by the tenth of any month to affect the mailing of the following month's issue of AMERICAN FORESTS.

Member A. B. C.

Copyright, 1936, by The American Forestry Association.



Photograph by Thomas O. Sheckell,
Taken in New Jersey.

"Blossoms of Spring"

White blushed with fairy pink, fragrant blossoms of spring,
Promise to the harvest moon of a ruddy offering.

—JOHN PHELPS.

Springtime

By
GRIF ALEXANDER

And the lovely rhododendron, smiling rose-hued at the morning from its hidden forest bed.

IN the Springtime sleeping beauties are awakened by the patter of the raindrops, by the growing warmth of sunshine, by the ever-changing rhythms of the songs of bonnie birds. When the sun has entered Aries there's stirring in the bosom of our loving Mother Earth. On the hills and in the valleys, in the forests, on the prairies, on the farms and in the gardens, there's excitement. All of Mother Nature's fairies in the buds upon the branches of the winter-dozing trees, in the crowns of herbs perennial, in the seeds of forest monarchs and the softly-creeping grass, feel a motion, feel an impulse to be up and doing something; so all the wistful willow buds throw off their downy blankets and the stout horse-chestnuts blithely crack their sticky resin chests, and the fruit trees sing in blossom while the holly and the cedar and the spruces and their fellows very slowly change their clothes; and the buds all cry for service and the sap just comes a-running bringing sustenance and vigor; and the brave new leaves appear.

Mother Earth with loving kindness nurses tiny lonesome seeds. Each has life and what it feeds on. Every cell has life and food. And the dainty fragile tendrils from their pericarps emerging climb toward the golden sunlight. Fairies, fairies every one, each an architect and builder. Every fairy builds a mansion of her own design and pattern, first providing a foundation for the building overhead. They are specialists, these fairies, in the seed and crown and bud; know their powers and limitations, all their plans and specifications bound by precedent and pride. From the left to right the dodder never fails to do its twining, but the honeysuckle circles right to left.

Oak trees packed in acorns dream of joyous days and pleasant in the future when their massive trunks are topped with sturdy branches, spreading branches growing tortuous with the passing of the years, growing gnarled and picturesque; dreams of birds and squirrels nesting in the leaf-protected branches; and dreaming thus a tendril shoots and starts to climb to heaven.

"A short life and a merry!" cries a toadstool in beginning its brief journey, proud of speed outstripping others, proud of contour and of color.

I am sure 'twould not surprise me if the lowly little carrot as it breaks the ground for building thanks the Lord 'tis not a turnip.

In the frozen snows a rosebud maybe knows it blows in summer. Every little bud and seedlet cherishes a happy ego. (Though entomologists may cavil that's the story I stick to.)

In the Springtime all our senses are delighted with the treasures Mother Nature in her bountiful beneficence unfolds. All the features of her circus come in orderly procession. Northward fly the birds and settle in their old accustomed homes. All the flowers of woods and meadows, jonquils, daffodils, narcissus, Jack-in-Pulpit preaching beauty as it nods to yellow crocus, sweet arbutus trailing with its auxiliary clusters, and the lovely rhododendron smiling rose-hued at the morning, from its hidden forest bed.

Like a bride, the dogwood wears a veil of gauzy, misty white

Then the dogwood and the laurel and the fruit trees in their order bearing blossoms; bare-limbed locusts bearing buds; dead leaves on the white oak sticking till the new green buds evict them; sharp pine needles making carpets growing thicker every year; wee red cedars upward springing here and there among the pines.

Springtime trying on new dresses always captivates the eye; Springtime ever changing frocks; garments trimmed with flowers and feathers; with a hem of pussy willows and forsythia and lilies. (Pussy willows please the poets; they are favored by the Muse; in the Spring in friendly manner they present their little paws.)

Every trifling change of weather works a transformation scene. Clouds make pictures in the sky; water colors; pastel pictures; wierd impressionistic studies; and the sun with gorgeous pigments paints the morning and the evening.

When the mist spreads o'er the marshes Spring's a bride in gauzy raiment. When the wind blows, music trembles in the treetops; sounds of music in the treetops like the waves upon the shore. But the lonely locust living on the hillside is complaining; making noises like a door on rusty hinges. After rain the forest odors joyously assail the nostrils, sweet fresh earth and growing pine; sparkling raindrops hang like jewels on the branches of the trees; frogs sing love songs after weeks of winter sleep. Cheerful Robin trills his rainsong; then flies down upon the lawn; there stands poised, still as a statue. Robin thinks he hears a worm.

Worms with industry digesting food the patient soil provides wonder where they'll find their heaven, in a bird or in a fish.

Fish are moving in the river, travelers who've known adventure, destined soon to get the hook. Squirming eels from southern waters where they met their English cousins, left them on their journey northward and with patriot pride unerring sought the mud their parents knew before them.

Crabs from muddy dens emerging gaily travel with the tide.

Wee mosquitoes in the marshes fatten up to feed the minnows; minnows travel to the river where the rock and bluefish wait; anglers catch the rock and bluefish; gourmets have them for their dinner; and they never, never, never, have a word of commendation for the starters of this cycle, the industrious mosquitoes. (This is one of very many of Dame Nature's melodramas.)

All our forbears loved the Springtime, seeing, hearing, feeling, smelling, and the products of their senses as it grew throughout the ages made the beauty that's within us sense the beauty that's before us. Equally esthetic urges stir the dogs with scent of rabbits.

In the Springtime, in the Springtime, youth and beauty fill the world. 'Tis a world of radiant promise with no hint of pain or failure. Everyone loves Spring!

THE CONTROL OF STREAM POLLUTION

By

KENNETH A. REID

JAY N. DARLING, when chief of the United States Biological Survey, pictured wildlife as an orphan child, "subsisting on the crumbs that fall from the tables of forestry, reclamation and other governmental agencies." The truth of this statement was emphasized at the recent North American Wildlife Conference—and a program was set in motion to do something about it. But there is another step-child of conservation, so far overlooked, which has been more wantonly abused and neglected than wildlife. That sick step-child is water.

Mines, factories and industries, municipalities large and small, even state and national institutions, including the capital city of Washington, all have dumped their wastes into the nearest stream as the easiest way of disposal without thought for others below them who must remove or neutralize these wastes before the water can be used. The pollution problem is a result of man's short-sighted and utterly selfish business economy, which in the final analysis is an entirely false economy when the composite picture presented by an entire watershed is studied. In its social aspects, the Golden Rule has long been submerged beneath the vile bosom of polluted waters.

Pollution being largely interstate in character, the author believes that neither industry nor the States may cure this sick child and ensure a pure water supply — but only the Federal Government. Here an attempt is being made to avoid pollution by sealing an old abandoned coal mine.

Pollution may be divided into two general classifications: municipal sewage, and industrial wastes from both active and abandoned industries. Industrial wastes are usually more destructive in their effects on streams; but an orderly procedure would suggest that municipal sewage and the wastes from abandoned industries be given first attention. When a corporate group of the public, such as a municipality, has clean hands by reason of having discharged its obligation to society insofar as water is concerned by the installation of an adequate sewage treatment plant, it can with much better grace demand that industry do likewise. The failure of most municipalities to clean up their own backyards has given industry a splendid alibi for not taking care of its wastes. Each waits for the other to act first, and too often the net result is no action by either.

Jurisdiction over water has been vested largely in the health departments of the various states, the United States Public Health Service and the War Department. Most health departments have been concerned primarily, if not solely, with the ultimate product that comes through the faucet to the consumer, while the War Department has been primarily concerned with navigation. The fact that a river that serves as a source of water supply might be so vilely polluted as to be absolutely dead biologically, is of little moment from the health viewpoint so long as the water companies using it as a source give that water sufficiently elaborate treatment to render it bacteriologically safe for human consumption. On the other hand, health agencies would be greatly concerned over a water supply that might be infinitely better, even to the extent of supporting an excellent growth of fish and aquatic life, if the water companies using this source pumped the water directly into the mains with insufficient treatment to render its limited bacterial content innocuous at the faucet.

But there are other uses of water, entirely aside from these rather material ones, in which the public is vitally interested and which have not been safeguarded adequately by the control vested in either health departments or the War Department. These uses are the biological functions of water, which in nature's scheme are the primary and major functions, and on which the recreational use, which every year is becoming increasingly important, is entirely dependent. It is in the protection of these values in water that our management has so far failed miserably.

The pollution problem as it affects public water supplies and as it affects recreation—which necessarily involves the presence of fish and aquatic life—is by no means identical or susceptible of the same treatment. Organic wastes like municipal sewage may not be detrimental to fish life unless the volume of sewage is sufficient to make a severe oxygen demand on the stream, but they are a menace to public health and the water must be treated to kill the typhoid and other bacteria commonly associated with such wastes. On the other hand, some industrial wastes in a water supply

may not be considered detrimental to public health, but because of their toxic nature, readily kill fish and other aquatic life. Again, certain highly toxic trade wastes in dilute quantities or other non-toxic wastes that blanket the bottom of the stream, may pass the requirements for both public health and fish, and yet the water may be practically barren of fish because the pollution kills the minute organisms that are the foundation of the aquatic food supply on which the fish are dependent for their existence. A further example of the different standards applying to fish and humans in the matter of water is the fact that fish of desirable game species will not live in the water that the average American citizen drinks from the water faucet, because the chemical treatment frequently required to kill the bacteria is sufficiently toxic to kill any fish that may be put in it.

Aside from strictly water supply considerations, sportsmen have in the past been practically the sole guardians of the purity of public waters, and they have been without official authority. The public generally has been most apathetic toward the appeals of organizations unselfishly leading the fight to make it water conscious. Opposing these efforts, polluters, both industrial and municipal, have countered with: "What are a few fish compared with our industries, the lifeblood of our people?" or "Would you close down industry so that a few fools may go fishing?"

Industrial waste is responsible for this. An acid plant has dumped its vats at the public expense. Aside from all ethical wildlife considerations, fishing is today in the "big business" class, bringing a revenue to the States of seven million dollars. Shall this be lost through polluted streams?

Let's take a look at the facts. The Senate Wildlife Survey of several years ago showed that 13,000,000 people in the United States were sufficiently interested in fishing and hunting to buy licenses, and that this outdoor army expended more than $650,000,000 annually in pursuit of these sports. Today this number has increased considerably, and it is a reasonable estimate that the annual expenditure now exceeds a billion dollars. The United States Bureau of Fisheries reports for 1933 a sale of 4,855,945 fishing licenses alone, with a total revenue from these licenses to the states of $6,586,810. Quite a different picture from the one painted by the industrialists of "a few fools who would go fishing"!

Fishing is indeed in the big business class with a list of stockholders exceeding in number that of any other business in the country with the single exception of its closely associated companion sport of hunting. Furthermore—and this is something that no industry can pass off lightly—it is the only business in America in which the demand far exceeds the supply, year in and year out. And unpolluted water is the first requisite for any fish supply.

The history of attempts to control pollution by local or state agencies is a record of futile effort. More than fifty years of legislative history in Pennsylvania discloses that practically every session has had its pure streams bill, but that every one has been defeated by the same group, the manufacturer's association, and always by the same argument. This argument is substantially as follows: "To require Pennsylvania industries to properly treat their wastes would penalize them in competition with industries of other states in the open market and thereby place Pennsylvania industries at a competitive disadvantage." Regardless of the merits of this argument—and it has some merit—its effectiveness cannot be denied in the face of the long legislative record. During the same period similar efforts have been made in these "other states" to correct their pollution, and these efforts have met essentially the same argument and result. The first state won't do anything that might put its industries at a competitive disadvantage with those of the second state, and this second state won't do anything about its pollution until the first state has acted, so neither does anything.

Similarly, attempts to control pollution by compacts between states have consistently met with failure. The reasons for these failures are obvious when we make an honest analysis of human nature, which is not generally altruistic, in spite of meaningless pronouncements to that effect. The injurious effects of pollution do not descend upon the polluting party, but flow away to plague others below, and both cities and industries are too much absorbed in their own fiscal problems to bother about additional expenditures for the benefit of neighboring cities or industries, unless they are obliged to do so. To expect an industry voluntarily to spend its own money for the benefit of another industry—that may be a hated competitor—is an absurdly Utopian view that ignores stark realities. Voluntary action, constructive cooperation with industry, persuasion and a lot of other high sounding plans have been tried out for years with negligible results. Nine out of ten polluters in any drainage unit may be disposed to cooperate, but when the tenth one balks—and almost invariably he does—the uniformity of action so essential to success is destroyed and the whole plan falls through. Elimination of pollution must be mandatory, but this mandate must be fair to all and detrimental to none to successfully accomplish the desired result.

How can this be done? By the simple and logical process of transferring to the Federal Government the direct responsibility for the purity of the nation's waterways. Immediately the successful alibi of competitive disadvantage to industry would evaporate into thin air, for all industries would be on a level competitive basis. As a matter of fact, when one studies the nature of streams and rivers it soon

becomes apparent that there is no other practical way to deal with the problem. Streams are governed by natural laws and the water in them flows from county to county and from state to state with utter disregard for man-made political boundaries. It is not possible to confine the effects of polluted water to the political division of its origin. More often than not, the injurious effects are felt in adjoining states below, and where this is the case we may rest assured that nothing will be done voluntarily by the offending parties for the benefit of the citizens of a neighboring state. As a matter of fact, the great majority of pollution is interstate in character, and as such can be handled on a fair and uniform basis only by the Federal Government.

In answer to those who question the propriety or authority of Federal control over pollution, there is limited authority now vested by Congress in the War Department, the Public Health Service, and the Bureau of Fisheries, and there is ample precedent for Congress to broaden this authority so that it might be really effective in solving the problem. Examples are the Interstate Commerce Commission, G-Men from the Department of Justice, Federal control over animal and plant quarantines, migratory birds, the airplane and the radio, not to mention a host of new fields of control that may be questionable. With the single exception of migratory birds, none of these Federally controlled activities are so truly national in their aspect and imperative need of Federal con- (*Continuing on page* 243)

In the upper picture is seen the start of pollution of a canal by the discharge of waste from a slaughter house; and, below, the same scene a little later on gives visual proof of what happens and that the injurious effects of pollution do not fall on the polluting party but spread and flow away to injure others below.

Photograph by P. Young

The beautiful, agatized, jewel-tinted witness to an era of great trees in ages gone—a fossil log in the Petrified Forest of Arizona.

THE JEWELED FORESTS OF ARIZONA

By

CRISTEL HASTINGS

With Photographs by The National Park Service

IF THE forests were God's first temples, then the most beautiful of them all must have been the rainbow and hyacinth tinted, agatized woodlands in Arizona.

Extending over a colorful area of more than one hundred square miles, the petrified forests near Adamana are the largest and the most amazingly beautiful on earth. While there are other areas in the world containing log-bearing strata, they are practically void of all coloring save for a grayish, bleached-out tint.

The fossil logs of Arizona are the only petrified forests in existence that show a richness of variegated coloring. There are five separate forests in all—the First, Second, Third or Rainbow Forest, the Sigilaria or Black Forest, and the most lovely of them all, the Blue Forest.

The three first named and the Blue Forest are contained in the Petrified Forest National Monument, the Black Forest is not under government control. It should be so protected, however, in order to preserve its beauty, and it is hoped it may be included in the Monument before souvenir hunters render irreparable damage in their zeal to carry away specimens of these multicolored petrified woods.

About 90,000 acres of agatized wood lie in Arizona, some 25,000 acres of which are included in the park. With hundreds of petrified trees still underground at various depths, the vast cubic extent of the log-bearing strata may never be known to any degree of certainty. The petrified logs that now lie exposed on the desert surface were buried originally hundreds of feet before erosion shifted the sands about and flood waters washed them up to the sunlight once more.

The fractured remains of these huge trunks, some of them more than six feet in diameter and over a hundred feet long, without either bark or branch, if reconstructed in their entirety, would indicate they once were noble trees of another clime and age, trees that must have reached common heights of 200 feet and even more. They are believed to have been of devastated forests, probably in what is now known as Canada, and to have drifted to their present resting place on floods that swept the continent during and immediately following the Triassic Period, millions of years ago. Most certainly these once huge members of a now extinct pine family (*Araucarioxlyon Arizonicum*) grew elsewhere. Their position in their sepulchers of clay and sandstone would indicate they must have drifted from one general direction only to settle gradually into their swirling tombs of mud and water where the slow

Photograph by George Grant

The Agate Bridge, artful piece of nature's engineering. Eventually uncovered by erosion's patient sculpting, this great log is nearly one hundred feet long and spans a gully fifty feet wide.

Photographs by
George Grant

This is the largest root system of petrified wood which has been found as yet among the National Monument groups.

Fittingly named "The Sphinx," this amazing monument, erosion-carved in the Rainbow Forest, gazes steadily out over the jeweled floor of the desert — where broken segments of petrified wood gleam, their brilliant colors reflected in the sunlight.

The Agate House, in the Third Forest, — on a height commanding a sweeping view of the desert, its buried treasure of jewel-like wood jutting forth, a scene of unique beauty unmatched in all the world.

alchemy of petrification took place through other ensuing centuries.

There are no upright trees in the petrified groups in Arizona, not even standing stumps except a few that have been tilted for observation and study. They appear in prostrate forest groups and the agatized logs are all on or in the sand.

Nowhere else on the face of the earth could this perfect art of alchemy have taken place, save in the desert. The most titanic battles of the elements have taken place here. Floods, the raising of mountain barriers toward the West between sea and plain, blazing solar heat, then modified rainfall followed by evaporation, disappearing lakes and rivers, until only thick alkaline layers of borax, salt, sodium nitrate and carbonate remained, all had their part in the relentless warfare staged on the desert by the elements.

All greenery disappeared as though it never had been. Grass and trees died and disintegrated. Rain ceased to fall. High winds blew over the alkali wastes and laid the bitter sand over everything. Thus the shattered logs that had drifted down on flood tides from the dark northern forests were buried deeper and deeper in their shrouds of sand and silt. The ensuing years saw to it that a coating of limestone hundreds of feet thick drifted over the tombs of the army of denuded forest giants that had been swept down from the north. On top of this was deposited a hard capping of red sandstone.

The pressure of millions of tons of alkali sands became more and more terrific. The chemicals in the dried lake bottoms and vanished river beds and in the Sierra began to slowly merge and mingle. Nature, as the great chemist, began to combine her chemicals, creating still others. The infiltration of water from underground streams containing dissolved mineral matter like calcium carbonate and silica began to produce a gradual petrification of the buried logs. In their tempestuous flood journeying all exterior ornamentation such as bark and branches had been lost. The desert winds had blown away everything except the heavy logs themselves. The deep alkali acres became a vast embalming chamber.

The intricate and incomparable work of tinting and coloring the prone masterpieces was accomplished in some mysterious way by solutions of iron and manganese which must have seeped down from the very heart of the desert mountains.

Although the coloring and texture of the jewelled woods are at great variance, the different groups of prone wood belong to the same geological layer. Their differences lie merely in the effect of certain erosion.

Of the three groups which comprise the forests within the park itself, the First Forest is, by far, the smallest. Erosion has bared numberless sections of petrified logs, washing away the layers of sandstone and clay in which they lay imbedded many hundreds of feet, until now—their ends broken and splintered—they gradually detach themselves. The First Forest deposit is part of the colored escarpments that form an appropriate setting for these carnelian and agate works of chemistry. There are some very interesting and fantastic rock formations, and erosion has carved some creditable statuary among the vividly colored spurs and knolls that betray their close relationship to the Painted Desert.

A half mile eastward from the First Forest lies an amazing piece of nature's engineering—the Natural Bridge. This extraordinary log is almost 100 feet long, spanning an arroyo, or gully, fifty feet wide and twenty-five feet deep.

Originally buried in limestone with thousands of its kin from the north, this great tree must have dammed the flood waters in a huge basin as the sand and silt accumulated over and about it for decades beyond counting. Finally, the waters began to run over its huge bulwark, gradually undermining it at one end, and the brittle, already pertified log cracked and broke. Erosion kept on with its endless sculpturing, the imprisoned waters washing away the accumulation of silt and sand and gradually enlarging another opening it had made under the middle of the log. At last an arroyo was carved under the center of the log, a small canyon through which rushed the now released waters with tremendous flow. The remaining sandstone crumbled away and there was left this great agate log, a bridge of jewels, to span the gully which had been gnawed by erosion through the sands of centuries.

Containing 2,000 acres, the Second Forest lies two miles south of the First Forest. This group contains logs of greater size and of less flinty texture than those in the latter group. Here in the very center of petrified logs are found beautiful amethyst chips and smoky topazes of rare loveliness. These diamond-hard gems are of great beauty and are, in reality, the resin from the heart of the tree, petrified. It is said that men once dynamited among these prostrate trees in their attempts to shatter the logs in order to find these highly prized crystalline gems. The work of uncounted milleniums destroyed in a sharp moment of greed and avarice! This one-time destructive practice probably accounts for the litter of agate chips that lie on the desert floor.

The Rainbow or Third Forest derives its more euphonious name from the brilliantly colored mass of fragments that lie in the western portion of this specific group. The chips are intensely vivid in colorings of blue, green, yellow, red, black, orange, violet and their in-between shades.

The Rainbow Forest is of greater extent than the First and Second Forests. It lies six miles toward the southwest of the First Forest. The deposits are of larger logs which appear in greater numbers. Confusion exists here in that the logs do not lie pointed in one direction but toward all points of the compass. Many of the reconstructed trees in this group must have been 200 feet and more high when they adorned far northern skylines. Here the logs are in excellent state of preservation, many of them more than 100 feet long. Cross sections of the logs piled in the Third Forest reveal bright rainbow tints of most exquisite blending. The logs present a deceiving, almost drab, outer appearance, mostly a muddy reddish brown. Where erosion has carved deep canyons and gullies the elements of uncounted centuries have split and shattered a great many of these colored bodies to mere mounds of agate chips, of jasper, of onyx, and carnelian.

Perhaps the foremost in beauty of the five horizontal forests is the Blue Forest. It, too, is the smallest of the five groups. Its variety of soft blue tinting gives it almost a refined, restful aspect in spite of evidence of terrific erosion that once took place here. Although these agatized forests were seen first by Caucasians in 1853, it was John Muir who claimed to have discovered the cerulean Blue Forest. This is the only group in which the logs seem to have remnants of roots.

Old timers claim that once these fossilized logs bore branches as well as roots, bits of which were easy to carry away, a habit that flourished without abatement until 1906, when the National Monument was established.

The Sigilaria, or Black Forest, comprises the fifth buried forest in Arizona's five great groups of petrified logs. Almost the doorway of the Painted Desert, the floor color scheme of the Black Forest is a marvelous shade of olive green. This green, blended with the onyx black that predominates in its carbonized logs, is most pleasing to the eye. Oddly enough, the wood structure of specimens in the Black Forest shows that palms were carbonized along with the now extinct species of pines prevalent in the four groups of agatized logs which, (*Continuing on page* 242)

HAS WILDLIFE A SENSE OF DIRECTION?

By CALVIN RUTSTRUM

With the far superior vision had by most bird life, the visual cues must obviously be greater.

THE peculiar tendency of man toward a willful belief in the superstitious, has made it intensely difficult to clarify the subject of whether or not animals and birds have a sense of direction. So great is this leaning toward willful thought in attaching some supra-phenomenal faculty to wildlife, that often vehement protest is launched against any effort toward rationalizing the subject. Even in scientific journals such ambiguities as "wave emanation", "teleception", "nature's broadcasting", and other terms equally far-fetched are encountered.

Whatever sympathy or aspersion one cares to cast into this arena of contestants for fact and falsehood, one thing seems sure—that where careful research has been made, the "supra-sensory faculty" theory has been compelled to give ground rapidly to the well authenticated conclusions that animals and birds find their way through the use of one or more of the simple senses, visual, olfactory, auditory, tactile, and muscular or kinesthetic.

Beyond this there is a begging of the question whether or not, in addition to the senses named, creatures of the wild possess some additional sensory endowment not yet revealed. This theory, of course, is worthy of consideration, as it comes within a rational hypothetical field; but the odds move constantly against such a theory.

It seems nigh impossible in the process of human thinking to regard anything in whatever light we may, other than from our own inflexible viewpoint. And it is very likely that the greatest difficulty encountered in trying to recognize the value of animal and bird senses, is that we are prone to evaluate them, singly or in combination, by the capacity standard of the sensory organs in human life.

This must necessarily be in error. The human frailties in the way of sense organs, blunted by artificial living, are too well known to need comment here. But it is utterly important that this incapacitation of man be kept in mind when examining the sensory strength of wildlife.

What, for instance, can be said of the visual capacity of a bird that moves in the night across open terrain, water, and forest area? In the mind's eye one is immediately confronted with a vast opaque density through which a mite of life travels with only human limitations of vision. With the far superior vision had by most bird life, the visual cues must obviously be greater; and would very likely be in direct ratio to these comparative sight capacities.

Most bewildering to the layman in his effort to grasp something tangible on which to base his belief, are the numerous hypothetical cases which come to him of how domestic animals find their way home from great distances —the so-called "homing instinct". Somehow most people fail to question the authenticity of these tales, with the result that they become like the old ballads, gaining greater proportion as they are relayed about. Like most phenomena of this kind, the exception is noted and passed off as a stock principle. However, as soon as aggregate experiments are

undertaken the whole tenor of these tales takes a different course.

If the "homing instinct" is what the phrase implies, that an animal or bird possesses some recondite faculty which brings it home, then it must be concluded that this faculty operates with a certain infallibility, barring accidents. But this is not what happens. Male cats, having a greater bent toward roaming than the females, show a better record for returning to their habitat than is the case with females; but it should not be assumed that either the males or the females have any special talent for reaching their homes from considerable distances.

Where experiments have been made by taking a large number of cats from their homes, even for very moderate distances, the percentage that reach home is very small compared to those that never return. And it has been found in the cases where cats have returned, that it has not been by some intuitive sense of where their habitat was located, but by the most haphazard and inefficient wandering. As soon as the animal is beyond the range of its acquired cues, if it reaches its original quarter at all, the circumstance is but rare and accidental. Moreover, it must be borne in mind that cats have a marked affection for localities and will return if they possibly can.

Unfortunately, in dealing with a subject of this kind, one is compelled to use as material only those creatures which come within the domestic realm, and within the confines of man's own sensory limitations. And although this may have the inference of being unable to comprehend what functions actually occur in the migratory movement of wildlife, it also implies that one may be impulsive when some metaphysical aspect is attached to this movement.

This inaccessibility to the actual sensory functions of wildlife does not necessarily hamper research. The sense functions of bees, ants, pigeons, and other life offer a fairly accurate cross-section of what may be expected of the sensory powers of wildlife in general. The work that has been done for the purpose of determining on what fundamental basis one might operate in studying the sense functions of animal and bird life has been very edifying indeed.

The great interest tendered the carrier pigeon by individuals and governmental bodies has done much to promulgate the theory that animals and birds, after all, are not led by some supra-sensorial faculty but by the simple senses heretofore named.

Scientists are quite well in agreement upon one thing; that the going has much to do with the coming. This implies, of course, that actual cues are gained in the going which govern the return. So apparent is this in the analysis, that if a pigeon is let loose in a strange zone, its return is only accomplished in a very protracted time, if it manages at all to return; and there is great likelihood that it will not. Those effecting a return have been found to circle for great distances, and have incidentally multiplied their chances of getting back. Once the cues of familiar territory are found, the return is, of course, quite simple.

This carries an interesting significance. Man's antipathy to ascribe learning to animal and bird life has always been a bone of contention between the scientist and the credulous, or willful thinking group. Nevertheless, one is forced to acknowledge the now much authenticated fact that pigeons must undergo a process of training if they are to be of value as carrier pigeons. Trainers usually base their selection of birds on degree of sight and muscular vigor. The pigeons are then subjected to a very rigid training through which a most obvious benefit is derived, with the result that trained birds become more superior in their ability to reach home than those untrained.

Nevertheless, in these trained birds, it is found that when they are taken five hundred miles away, they return with considerable difficulty and make numerous mistakes. Snow and fog badly hinder their flight and delay their return. Untrained birds taken the same distance often do not return at all, or do so after long, blundering effort.

In a recent experiment, five thousand pigeons were taken from ninety to three hundred miles from home. Fifteen hundred were set free three hundred miles away. Three hundred returned after forty-eight hours. The others spread over so vast an area as to include the continents of Europe and Africa.

In the shorter distances, the number of pigeons that returned was in ratio to the distances that the birds were taken. Those released in the nearest zone showed a marked increase. It was evident that as the cues increased, so did the chances of their getting back home.

Now, if the supra-sensory faculty had been in operation, these pigeons should have had little trouble in setting their divining instruments and taking the straightest line home. Instead, they showed an unmistakable reliance upon the simple senses with which they are endowed; recognizing, of course, that their sight and cue memory is superior to man's. It is interesting to note in connection with this point that night flying was suspended, and that where the daylight hours were greater in proportion to the distances, return was more rapid.

Almost everyone is familiar with the novel aspect of the so-called "bee-line" through which the farmer boy manages by a process of triangulation to find the "bee tree"; releasing bees at two different points and locating the tree at the converging point of the bee lines. This novelty, innocent as it seems, has been the topic of much argument, some truth, and a great deal of fiction.

The sense of direction as here recognized in the bee, comes to issue very much as in the case of the pigeon. The matter of attaching some supra-sensory appendage to the bee and his flight loses ground rapidly in the light of investigation. As stated, the going determines to a great extent the coming; and without the cues familiar to the bee in its foraging, the chances of return are small.

In an instance where seven bees were transported a distance of three miles in a vegetated area, four returned. Repeating the same experiment with forty bees, fifteen returned, two in forty-five minutes. On a level piece of ground where ninety were transported three miles, thirty returned. Taking the same number an equal distance in hilly country, even a less number of bees returned. When it is considered that when a like number were transported only to the limits of their foraging area and all returned, it is very safe to assume that there was a desire in all bees released to return to their original habitat, and that many lost their way.

The significance of these tests is apparent. Had the bees not been guided by certain cues learned through contact while foraging, the return would not have manifested itself in a series of majority failures. It might be concluded that extraneous influences may have prevented the return. By eliminating these possible influences with an experiment near the sea, a very effectual conclusion was gained.

A number of bees were released two hundred and fifty yards from a hive near the sea where they were not accustomed to fly. None returned to the hive. Others were released two hundred and fifty yards from the hive in a garden where they were accustomed to forage. All returned to the hive, and without delay. A repetition of the experiment brought about the same result.

It is obvious then that the matter of cues must enter into the return of these foragers. Pursuant to this idea, it has been noted that young bees, (*Continuing on page* 248)

EDITORIAL

"The Earth Disease"

RECENT floods in the East and South have again brought home with impressive reality that the House of Nature no less than the House of Congress is accelerating the tax burden of the American people. When the bill of 1936 floods is finally written—if it ever is—it will show a startling figure of lives lost and injured, property destroyed and rehabilitation costs. Most people do not think of floods and similar Acts of Nature as a tax upon the individual, the community or the nation. Nevertheless, they are a most vicious form of taxation in that they impose a triple levy upon the people: First, the cost of property destroyed, second, the cost of rehabilitation and, finally, the cost of correcting the causes in order that repetition of the catastrophies may not occur.

Much is being written as to the cause of this spring's floods and much of what is being written is confusing. Some writers place the blame primarily upon deforestation of watersheds; others upon mistreatment of agricultural soils; still others upon unusual weather conditions. All are probably right in some measure, but it is misleading to say that the floods were caused by any one dereliction of man or nature. The full facts unquestionably are that the floods were due to a combination of factors, all of which have their source in what Morris L. Cooke, who was Chairman of the Water Resources Committee of the National Planning Board, referred to in recent testimony before a committee of Congress as "the earth disease." This disease has grown out of the variegated mistreatment and mismanagement of our soils, which have destroyed nature's checks upon the movements of water and soils. Floods, dust storms, streams of yellow water are merely symptoms of this earth disease. Loss of life and property and great outlays for rehabilitation are its periodic exactions, which become greater and more frequent as the cause of the disease is neglected.

"As matters now stand," said Mr. Cooke, "and with continuance of the manner in which the soil is now being squandered, this country of ours has less than one hundred years of virile national existence. If that represents a reasonably accurate statement, it is vastly more significant that we have probably less than twenty years in which to build up the technique, to recruit the fighting personnel, and most difficult of all, to change the attitude of millions of people who hold that ownership of land carries with it the right to mistreat and even to destroy their land, regardless of the effect on the total national state."

There are two ways to deal with this earth disease. One is to let it go unchecked, or, what is almost as bad, to attempt to arrest it by spotted efforts dictated largely by political opportunism. The other is to attack the disease at its core, applying the best known remedies to each affected part of our land body much as a group of medical specialists would deal with a major infection of the human body. No intelligent person would recommend the former course, particularly in the light of present day knowledge of the earth disease and how to deal with it constructively. Our human difficulty is not lack of knowledge but lack of ability to organize and apply known technique in the most orderly and effective way. Vast sums of public money have been spent in building dams, levees and other works designed to control water after floods occur; smaller sums have been expended for the purchase of lands for the forestation of watersheds; increasingly large sums are now being spent to check soil erosion. All of these and other activities are essential parts of the technique of curing the earth disease. Their application, however, has been haphazard and unrelated with the result that no single river basin is ever cured. Figuratively, we have called in many doctors and put them to work more or less independently upon a disease that calls for the integrated technique of different specialists.

Ours is a vast land and every major watershed is a problem in itself, determined by the character of its streams, its soils, its terrain, its climatic conditions and the degree to which its resources have been abused. Real solution in each case begins with a skilled diagnosis followed by an operating plan that puts into play the technique best designed to deal with the special set of problems peculiar to the watershed involved. The 1936 floods already have washed a dozen or more flood relief bills into Congress. Hundreds of millions of dollars may be voted. These funds like those heretofore spent by the states and the Federal Government will come from the pockets of the American people in the form of taxes. The expenditures will be money in our pockets in the long run only if properly made. That they are properly made should be the prime concern of the American people, and this, we believe, calls for insistence that our watersheds be factually studied and classified according to their public hazards; and that expenditures be confined for the most part to critical drainages under project plans that apply remedial technique in intelligent relation to underlying causes of soil and water catastrophies within the river basin concerned.

Planning Fire Lookouts in California

By A. A. BROWN

The visible area mapper at work. Trained men record exactly what territory can be seen from every possible lookout point.

◆

A typical prospective lookout point from which the "visible area mappers" worked.

This same point after being approved for the detection system and the lookout building completed.

THE most difficult problem with which the western forester has to deal is the protection of forest lands from fire. The success of every constructive plan he builds and the continued enjoyment of every use the public makes of the National Forests depend on his effectiveness in meeting this issue.

Speed of action is the key to success in controlling forest fires. Every endeavor has therefore been made to reduce the interval between the discovery of a fire and the attack upon it. Every act that enters into fire control has been scrutinized with a view to cutting down time until, despite the difficulties imposed by rough travel in mountainous land, the speed and precision of a city fire department are at times approached. Organized crews, telephone lines, roads, motor equipment, form parts of the picture and they all save precious minutes.

But quick discovery and right location of a fire are first essentials to quick and effective action. Here is the place of forest lookouts—the eyes of the forest-fire organization.

Lookout stations have long been used on the National Forests, but they have been erected largely to meet local needs and problems and their limitations have not always been taken fully into account. It has been demonstrated that they cannot report effectively for any territory more than fifteen miles away. They are real sentries only for the country that lies before them like an open book. In extensive timber areas isolated lookouts are notably inefficient. In California in 1933, a plan was conceived for building the fire lookouts of the State into a unified system, with the territory seen by one fitting into that of the next like a jig-saw puzzle, all the way from the Klamath Forest on the Oregon line south to the Mexican border. A model plan tested on the Shasta Forest was in readiness and emergency forest funds gave reality to the scheme.

The first need was a record of what territory could be seen from every possible lookout point. To obtain this, eighteen trained men were sent out. Theirs was the task of climbing every promising mountain peak or vantage point and there blocking in on a map by pencil and crayon exactly the slopes and valleys which they could see. In a short time they became masters of a new trade and many "old timers" were amazed at such discoveries as that an observer on Mount Baldy could see only a few ridge tops or that from Red Mountain he could see the bottom of Bear Valley only at Eagle Creek. These men, termed "visible-area mappers," picked vantage points, not only to overlook the country, but particularly to see danger areas within the fifteen-mile limit mentioned. From the April snows in the northern Sierras their work progressed to the January storms on the Angeles and San Bernardino of southern California. A steady stream of visible area maps, totaling over 1,200, came into the central mapping office and mountain-climbing records were made that a professional would envy.

In the central office, records of twenty years of forest fires were scanned to determine the danger areas. If a little

spot is placed on a map where each fire starts, in a few years the spots will form groups and patterns indicating the localities most often endangered by fire. If the spots are put on separate maps by each cause of fire, very significant facts are revealed. Man-caused fires will reflect men's habits, routes of travel, and dwelling places. Lightning fires are more capricious in their occurrence, but a twenty-year history reveals that they, too, occur much more often in certain areas.

By drawing a line around each group or pattern of fire occurrence, these localities stand out as areas with a definitely measured threat of fire. Each forest map treated in this way was colored by "intensity" zones, showing the relative danger of the different areas based upon past fires. With this done, all was in readiness to use the visible-area maps. These maps, copied on transparent sheets, and placed over the prepared forest map, give a pattern easy to read, from which a rating can be calculated to represent number of fires times acres. When all these ratings are arranged in a list from the highest to the lowest, it is easy to pick out the most effective vantage points for lookouts. The points having the highest rating is considered first, and if there is no important obstacle to its use as a lookout point, its pattern is fixed on the map. Then the search begins for the point whose pattern of "seen area" will add most to that of number one, and so on until none can add enough more to be worth while.

This process is not the whole story. Other important things enter into the value of a forest lookout. But it narrows the problem to decisions based on known facts, making it easy to take full advantage of detailed local knowledge and the seasoned experience of the forest ranger and his superiors.

A danger signal—the advance of a forest fire at night. In California's war on fire, her unified lookout system has proved a great weapon in her war on forest fire.

Progressively, the 1,200 California maps narrowed approved lookouts down to 268, as ordered plans took shape on one forest after another, on the contiguous State-protected areas, in Los Angeles County, and on Sequoia and Yosemite National Parks. With a statewide plan built in this way, lookout construction has taken a prominent place in the emergency forest activities in California. Lookouts so located are being built with the assurance that they are permanent and represent an investment in the State that will pay cash dividends in reduced fire fighting costs.

The ordered plan of systematized lookouts has taken shape on one forest after another in California. This shows valuable timber which is guarded by Pegleg Lookout on the Lassen National Forest.

The water garden in the Native Plant Preserve at Charles City, Iowa, is a wonderful piece of conservation work and shows what can be done locally. It is surrounded by all kinds of native trees, shrubs and flowers — blue gentians, pink lady-slippers, — and here, too, the American lotus, pickerel-weed, arrow-head cat-tails, blue-flag, spatter-dock and all their kin flourish.

THE OUTLOOK FOR THE WILD FLOWERS

By MRS. FRANCIS EDMUND WHITLEY

GIVEN many centuries ago, the world has been slow to receive and act upon the precept, "Overcome evil with good." Only gradually has it been realized that one do is worth many don'ts, that plans for right action are stronger than prohibitions alone. Nevertheless, there is much encouragement in the signs that constructive projects may supplement restrictions in protecting our wild flowers from extermination.

We shall still need the warnings and prohibitions; the education through our schools, and the legislation already secured in more than twenty states providing some measure of protection for native plants. But there is more of promise in the efforts which now look not only to protecting the wild flowers but to multiplying their ranks.

This movement has come about in recent years largely from a new appreciation of their beauty by the public. This may have been awakened by the continued agitation of conservationists pleading for wild flower preservation, or by the effective use of native materials by landscape architects. At all events, the public which has long regarded wild flowers as something pretty and everybody's property, all at once has realized that they are of value— a wealth of beauty neglected and approaching extinction; flowers lovely as any in our gardens, disappearing from their native haunts.

This awakening is seen in many ways, few more striking than the marked increase in recent years in the number of wild flower sanctuaries which have been created in many states. They are like "cities of refuge" where native ferns and flowers can grow undisturbed. In some of the larger parks, certain portions have been set aside for this purpose, with prohibitions against roads and picnic parties which destroy as they enjoy.

It gives a thrill of pleasure to one who really cares for the beauty of unspoiled nature to think of sanctuaries for birds and flowers like "Wychwood," the hundred acres of virgin Wisconsin forest, set aside by the Charles L. Hutchinsons of Chicago to preserve for the future something of the primitive beauty of the wilderness; or like the three hundred acre Pleasant Valley Bird and Flower Sanctuary near Lenox, Massachusetts, with its miles of trails and its museum in the transformed old barn, an ideal spot for the student of nature lore.

There are other extensive sanctuaries like these, and it would be pleasant to visit them all, but perhaps there is as much encouragement in thinking how many other retreats, large and small, have been created all over the country. There is the thirty-five acre tract along the river at Charles City, Iowa, for instance, where a group of women led by a

pioneer nature-lover, has for many years been making a home for the flowers that the early settlers knew, with specimens of every tree and shrub native to the state.

There is real encouragement, too, in the growing number of colleges and schools which have acquired tracts for sanctuaries for plant and animal life—the University of Vermont, the Connecticut College for Women, Antioch at Yellow Springs, Ohio, the University of Kentucky at Lexington. And many others are instituting these out-of-door laboratories for studying botany and ecology.

In Minneapolis, it was the teachers in the public schools who recognized the need of opportunities to study plant life in natural conditions, and who gave unpaid service in caring for a tract for that purpose in Glenwood Park until its value was recognized; then twenty-five acres were set aside and a curator appointed. Now it is the Native Plant Reserve, a home for a marvelous variety of flowers of woodland, hills, and bogs, and a refuge for the birds as well.

People are, fortunately, awakening to the wealth of natural beauty neglected and approaching extinction through careless use of our woodlands, where flowers are found as lovely as any in our gardens and an enthusiastic interest should be directed to prevent their disappearance from their native haunts.

The railroad right-of-way has been called the last stand of the prairie flowers; here they are not easily accessible to the greedy picker, but flourish to make a bright spot for the mental refreshment of the weary traveler. Evidently railway officials realize that anything that makes travel over their lines more attractive is worth preserving, for in several cases they have responded courteously to the suggestions of flower lovers to refrain from cutting or burning the vegetation along the right of way until after the blooming season.

But aside from all the public "safe harbors" for the wild flowers there are thousands of home gardens and private estates where they have a place; in fact so popular have these wild flower gardens and "woodsy spots" become that their fame threatens a new menace to the flowers. If they are planted, as is not infrequently the case, just to gratify the desire to share in a new fad, without any acquaintance with their habits or needs, without ascertaining the source from which the florist has obtained them, slow death is apt to be their portion and the earth just so much poorer for their loss.

But when the true wild flower devotee reproduces in his own grounds, as far as possible, the natural conditions in which the flowers grow, the soil, light, shade, and moisture, the plants may survive, flourish, and reproduce; that is real conservation, and the home garden has been enriched without robbing the countryside of its beauty. It is possible now by chemical analysis of the soil where wild flowers have grown, to know whether the plants thrive best in acid, alkaline or neutral soils. Lists of the preferences of most wild flowers, convenient aids for testing garden soil and methods for adjusting it to the needs of the new flower tenants may be secured from the Wild Flower Preservation Society, 3740 Oliver Street, Washington, D. C.

When the wild flower garden can only be stocked by ordering from a nursery, the (*Continuing on page* 240)

Fred E. Brooks

Fifteen years ago, this was a piece of rocky ground, — cleared of trees, burned over and sown to grass. The land was protected, fires and grazing stock kept out, and without any planting whatever it has now developed into a beautiful wild flower garden and, incidentally, into a rising young forest.

LOT'S WIFE LOOKED BACK

And Forest, Field and Wildlife Suffer from Salt And Other Residue from Louisiana Oil Fields

By SAM MIMS

DORCHEAT Bayou, in Claiborne Parish, Louisiana, was named by the Indians, but pioneers from the Carolinas, from Georgia and from Alabama, settling there in the early part of the nineteenth century, designated a tributary flowing out of the hills to the east, Flat Lick Creek. To the woodsmen, this appellation had but one meaning. Within the territory traversed by the tributary could be found small domes where deer came to partake of salt—tiny barren domes that defied vegetation.

Dorcheat Bayou, around which pioneers settled early in the Nineteenth Century, before its waters were polluted by oil operations at the headwaters of its tributaries.

Extensive salt licks have existed along Flat Lick Creek for 10,000 years, but not until residue and salt from the oil fields were turned into its waters was there widespread destruction along its course—as pictured above.

The pioneers could not know that the characteristic name "Flat Lick" would, one hundred years later, become anathema to their progeny; they could not foretell that "Flat Lick" would become as salt in the eyes of jurists or give double-vision to eminent scientists. They were not prophetic enough to see forests laid bare, streams polluted, grass destroyed, the water made unfit to quench the thirst of animals, all because in their innocence they had given a creek the name of "Flat Lick."

In those early days there was no prophecy that one hundred years later oil fields would be found and that farms would be cluttered with derricks, or that millions of barrels of oil would flow from beneath their corn rows.

But in 1920 the deluge came—a deluge of liquid gold, followed by steady streams of salt water that came from deep down in the earth.

Early in the summer of that year an old negro hurried from his cabin with a fishing pole, grabbed his urn-shaped gourd that had been filled with squirming red worms, mounted his mule and headed for Dorcheat Bayou. Saturday afternoon was fishin' time.

Within an hour he was returning, urging his mule homeward at a swift trot. There were queer thoughts in his head, for his eyes had seen terrible things. Once inside the home plantation gates, he sought out its owner.

"Mr. Johnson, come out here," he shouted. "I done see a sight and I done smelt a sight mo'!"

The white man was getting ready to journey townward, but he paused to listen. "What's the trouble, Ike?"

"De bayou is so full of dead fish dey ain't nowhere to drap a hook in de water. Fishes piled up against logs and cypress knees; fishes everywhere. And stink! I ain't never smelt sich a smell in my life. And de water jist as clear as a lookin'-glass."

Ike wasn't a liar. Ike wasn't drunk. The white man accepted his story. Immediately the news spread, and scores of men and women went down to Dorcheat Bayou to see for themselves. They found that the half had not been told.

During the days that followed thousands of black bass, striped bass, white perch, bream, goggle-eye, buffalo and catfish were raked and dragged from Dorcheat Bayou and hauled away in wagons. It was whispered about that a terrible plague had descended upon the people who had for so long depended upon Dorcheat and its tributaries for a goodly amount of their food.

Farmers, sportsmen, newspaper reporters, representatives of the State Conservation Commission, women and children, the lame and the blind, came to get first-hand knowledge of this mysterious carnage. The dark, lazy water of Dorcheat Bayou had suddenly become crystal clear. Grains of corn, nickels and dimes were dropped into the water just to prove its transparency to new arrivals.

Droves of cattle, with tongues lolling from foaming mouths, abandoned the luscious grass and cane reeds of the lowlands and returned to farm homes, bawling out their distress in mournful chorus. Many of them died before their owners learned that they were famishing for water. Even snakes, eels and turtles were unable to survive. Their bodies floated against the logs and cypress knees and mingled with the great masses of dead fish. Wild animals abandoned their old haunts.

Then heavy rains began falling. Flat Lick rose over its bank and flooded a portion of Edwin S. Toadvin's farm. When the water drained out of the fields and pastures and receded into the bayou, Mr. Toadvin went over his farm to make a general inspection. He was amazed to find that his corn was dying, that the grass in his pasture had lost its coloring of green, that along fences and against trees there were cakes of dark brown substance.

When every particle of vegetation that had been touched by the overflow water began turning brown and trees began dying, farmers and land owners started an investigation. It was soon discovered that in the Haynesville and Homer oil fields a very strong precipitant was being used to separate foreign matter from oil and that the residue was being turned into brooks and creeks that drain into Flat Lick, and thence into Dorcheat Bayou. Added to this was the constant flow of salt water that was forced out of the wells producing oil.

Suits were filed against seven of the major oil companies operating in these territories, asking the court to enjoin, restrain and prohibit these operatives from permitting this residue concoction from being turned into the streams.

In the case of Edwin S. Toadvin *vs* Standard Oil Company of Louisiana, the plaintiff alleged:—"That defendants, by pumping, throwing, running, depositing, turning and wasting oil and salt water and other poisonous, dangerous and injurious substances into Flat Lick Creek, a non-navigable stream, have destroyed all fish and animal life in said stream, have polluted and poisoned the water so that it is unfit for man and beast to drink, and unfit for use in any manner; that the oil and salt water have destroyed and will continue to destroy the grass, growing crops, trees and vegetation; that the residue from the oil fields covers and adheres to trees, bushes, leaves, fences, buildings and other combustible matter and has caused and will continue to cause fires to break out and destroy timber, fences and other property."

The plaintiff asked that the defendant companies be re-

The forest around Dorcheat Bayou and Flat Lick Creek prior to 1920, when oil was discovered. Not only did it supply lumber and other wood needs of local communities, but it teemed with native wildlife.

The forest around Dorcheat Bayou as it appears today—victim of polluted waters. Two years ago shingles were needed to repair homes in a nearby community—and they were imported from Canada. All that remains of wildlife here is the mournful call of the dove.

quired to show cause why a mandatory injunction should not be issued and they be prohibited from continuing this destruction.

This was the only case ever brought to trial, for the reason that the defendant oil companies presented expert and scientific testimony that the salt water, the oil and the concoction of precipitants used in treating the oil, did not kill fish, did not destroy vegetation, and in no manner polluted the streams.

An agricultural chemist from one of the State universities testified that he had made a careful analysis of water taken from Flat Lick and that it did not contain anything that would kill grass.

In order to forestall any proof that salt water was killing shrubbery, grass and trees, the defendant companies availed themselves of the expert opinion of a petroleum geologist. His testimony revealed that the salt licks along Flat Lick Creek were more numerous than along any other creek in northern Louisiana and southern Arkansas. He also declared that the salt licks were at least 10,000 years old—9,999 years older than the source of salt water flowing from the oil fields.

It didn't seem to matter that during these one hundred centuries preceding the discovery of the oil fields these little salt domes had never disgorged salt water sufficient to destroy hundreds of acres of vegetation and thousands of pounds of fish. True it was that these little mounds—no one of which covered an area larger than a small bed room—had supplied saline for cattle and wild deer, and had even been bounteous enough to furnish salt to a few hardy pioneers more than a hundred years ago; true, too, these barren spots had given plausible reason for a characteristic name for the little stream that had been friendly and generous to farmers and sportsmen during these many years. But to be accused of destroying pastures, forests, fish, cattle and wildlife was undeserved condemnation.

Sixteen years have passed. Wanton destruction from the oil fields continues. There are no fish in Flat Lick. Dorcheat is a barren stream from the point where its tributaries deposit the poisoning concoction that drains from the oil fields to where it flows into Lake Bisteneau, and along this once-generous stream thousands of dead trees stand today.

In December, 1934, a hail storm fell upon the little city of Minden, destroying the roofs on about a third of its houses. The shingles that repaired those homes were imported from Canada. I called this fact to the attention of a man who was born and reared near Dorcheat Bayou.

"It's a shame," he said. "When I was a boy there were enough cypress trees along Dorcheat Bayou to supply sufficient shingles to cover and recover every house in Claiborne and Webster parishes for the next hundred years."

Today the only sign of wildlife encountered is the mournful call of a dove, denoting grief-stricken emotion. The natural dark water of Dorcheat Bayou is today just like Ike described it sixteen years ago—"clear as a lookin'-glass"; and to prove it we dropped a fifty cent piece into two feet of water and easily read, "In God We Trust."

But the farmers, the lovers of trees and wildlife, do not put much trust in the testimony of scientific experts.

The Head Ranger From Burma to Bombay

"The gigantic German who was the head of the Woods and Forests of all India, Head Ranger from Burma to Bombay, had a habit of flitting bat-like without warnings from one place to another, and turning up exactly where he was least looked for. His theory was that sudden visitations, the discovery of shortcomings and a word-of-mouth upbraidment of a subordinate were infinitely better than the slow processes of correspondence, which might end in a written and official reprimand—a thing in after years to be counted against a Forest Officer's record. As he explained it: 'If I only talk to my boys like a Dutch uncle, dey say,—It was only dot damned old Muller,' and dey do better next dime. But if my fat-head glerk he write and say dot Muller der Inspector-General fail to onderstand and is much annoyed, first dot does no goot because I am not dere and second der fool dot comes after me he may say to my best boys: 'Mein Gott! you haf been wigged by my bredecessor.' I tell you der big brass-hat pizness does not make der trees grow.

"Muller's deep voice was coming out of the darkness behind the firelight as he bent over the shoulders of his pet cook. 'Not so much sauce, you son of Belial! Worcester sauce he is gondiment and not a fluid. Ah, Gisborne, you haf come to a very bad dinner. Where is your camp?' and he walked up to shake hands.

" 'I'm the camp, sir,' said Gisborne. 'I didn't know you were about here.'

"Muller looked at the young man's trim figure. 'Goot! That is very goot! One horse and some cold things to eat. When I was young I did my camp so. Now you shall dine with me. I went into Headquarters to make up my report last month. I haf written half—ho! ho! —and der rest I haf leaved to my glerks and come out for a walk. Der Government is mad about dose reports. I dold der Viceroy so at Simla.'

"Gisborne chuckled, remembering the many tales that were told of Muller's conflicts with the Supreme Government. He was the chartered libertine of all the offices, for as a Forest Officer he had no equal.

" 'If I find you, Gisborne, sitting in your bungalow und hatching reports to me about der blantations instead of riding der blantations, I will transfer you to der middle of der Bikaneer Desert to reforest him. I am sick of reports und chewing paper when we should do our work.' "

From "In the Rukh"—Kipling.

SAVING THE SUGAR ORCHARD

By

MARY CARPENTER KELLEY

THE passing of the picturesque sugar orchards of New England, as prophesied of late by certain students of rural occupations, would be a calamity. There are many reasons why, not the least important of which is that we have too few survivals of such romantic out-of-door farm activities as soap-making, hulling corn, and sugaring-off; and if the sugar or sap orchard should disappear entirely, so would one of the most loved and quaintest of the country industries.

For when March comes with its cold nights and warm days and sap courses through the veins of the sugar maples, just as surely does the urge come to the man on the farm to tap whatever sugar trees he may possess. All through New England, wherever there are sugar maples of any size, some sort of container—anything from a glass fruit jar to an old-fashioned sap bucket—will be hung to catch the dripping sap as long as it runs.

Perhaps it is only the farm boys who are sapping, boiling down the sticky syrup in their own camp where they can make all the mess they desire with the smoking wood fire and the steaming syrup kettle. Or perhaps it is the farmer's wife who tends the five or six maple trees about the house, making a few quarts of syrup on the kitchen stove. But usually it is the farmer and the hired man who tap the orchards in a business-like manner, gather the sap and convert it into syrup and sugar in the old sap camp down in the pasture.

This is all very well for the present generation and perhaps for the next one, for there are thousands of great maples in the prime of life in New England today. But what of the future? Unless new trees are planted to replace those that must be cut every year because of old age, or unless lumbermen take pains to save the young maples, what will happen to the sugar orchards of the future? This is a question being asked in Maine and New Hampshire just now, and farmers discuss it as if they had never thought of the problem before. But Harry A. Smith, of Waterboro, Maine, has been giving the question much thought. In fact, without making a fuss about it or even airing his views of the subject, he has already made a good start in establishing a new sap orchard.

Great old sugar trees—probably the oldest and largest in New Hampshire. Modern galvanized pails catch their cool, sweet dripping sap.

Some years ago Mr. Smith came into possession of 275 acres of woodland on the slopes of Mt. Ossipee, near Waterboro. The tract was a part of the farm cleared in 1800 by Josiah Swett, of the seacoast town of Wells, and on it were a great many old maple trees. It was the presence of these veterans, scarred by the tappings of a hundred and thirty years, that set Mr. Smith to thinking. These ancients, he reckoned, would not last many years. And after them—what? What about the maple sugar business of the future?

He had acquired the tract for the timber that was on it, and as he planned for logging he decided to conserve the maples and the pines, the latter for further growth and the former for a huge sap orchard which could be worked for generations to come. So he directed his woodsmen to save every healthy young sugar maple, as well as the old maples.

As the result of this plan he began to tap the new trees in the spring of 1929. Each succeeding spring he tapped a greater number, until last year he set 1,200 spiles and hung the same number of buckets on the trunks of as many vigorous young maples, all producing sap abundantly. He has lost a few of the old trees, but he doesn't worry. He is replacing them a hundred to one.

The original Swett sap camp had gone, so Mr. Smith built a new one on the mountain, equipping it with every modern device for boiling down the sap into syrup and the syrup into sugar. A system of pipes carries the sap from scattered reservoirs to the main tank at the camp so that there is no longer need for a sled and pair of oxen to haul a lurching hogshead of sap down the rough road to the boiling-place as of yore.

In fact, the whole project of tapping, gathering sap and converting it into the marketable product is done

(*Continuing on page* 242)

Field and Forest for Boys and Girls

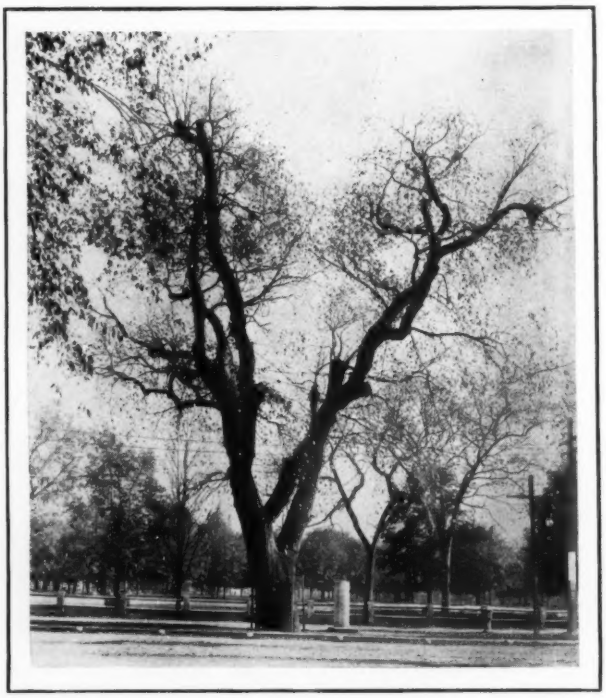
THE ELM--AMERICA'S TREE OF GLORY

By Erle Kauffman

As this is written, late in March, thousands of boys and girls, particularly in the northeastern part of the country, are turning their eyes skyward in eager anticipation of the first green blossoms of America's most cherished tree, the elm. Later on, when its sharp pointed, double toothed leaves appear, they will be lured to its abundant shade to play, to study, to plan, to dream, little realizing, perhaps, that under the dignified and courtly elm some of the most interesting events in American history have taken place, that it is often referred to, and rightly so, as America's tree of glory.

Particularly today, when the existence of this stately tree is seriously threatened by an European invasion of the deadly Dutch elm disease, which has caused the destruction of thousands of elms in New York, New Jersey and Connecticut, are Americans looking to its beauty, its charm, its characteristic place in the eastern landscape, and its cherished niche in the nation's history.

Of course every boy and girl knows that it was an elm tree at Cambridge, Massachusetts, that shaded General George Washington on July 3, 1775, when he took command of the Continental Army. But perhaps there are few who realize that sturdy sons of this great old tree are growing in America today. One is growing at the Arnold Arboretum, near Boston, another on the campus of the University of Washington, at Seattle, and still another at Wellesley, Massachusetts. They were propagated from cuttings from the great Cambridge tree before it succumbed to old age in 1923.



The Cambridge Elm

There are several other old elms in the country closely associated with the First President. On the grounds of the Capitol at Washington, D. C., a great elm rises in majestic symmetry. Its branches sheltered George Washington on many afternoons while he watched and directed the construction of the Capitol building.

In 1747, when Washington, as a young man, was surveying the vast lands of the Right Honorable Thomas Lord Fairfax, he was greatly impressed by the medicinal value of certain springs near Berkeley, West Virginia, which, tradition says, were outstanding factors in Indian warfare for many centuries. He passed the word of their healing qualities on to the pioneers and the vicinity was quickly settled. Washington then planted an elm tree at the intersection of the new settlement's main thoroughfare and the southern boundary of the grant of Lord Fairfax, forming a survey corner. The tree today is twenty-one feet in circumference, and is lovingly known as the "Washington Elm."

Indeed, the elm seems to stand as a green monument to George Washington, and while all of the trees recorded in his name cannot be mentioned here, there are two others which should be known to boys and girls—the great elm at Palmer, Massachusetts, from the shade of which he addressed his troops just before taking command of the Continental Army, and the elm which stands beside his headquarters at Valley Forge. This tree, a scion of an elm planted by Washington, was

planted as a monument to him in 1888.

On the shores of Pine Creek, near Clinton, Pennsylvania, stands a majestic elm, spreading its branches over some of the most historic ground in this country. Sometimes called the Tiadaghton Elm and sometimes the Pine Creek Elm, it is better known as the "Liberty Tree." For under this tree, it is related, a group of Pennsylvania back woodsmen, known as the Fair Play Men, signed the famous "Tiadaghton Creek Declaration of Independence" at the same time the Declaration of Independence was being signed at Independence Hall, in Philadelphia. And while the Liberty Bell tolled its thunderous message of freedom, two horsemen rode from the shade of the Liberty Tree through the night to the Fathers of Independence at Philadelphia, with the scroll of the Tiadaghton Declaration.

Possibly many boys and girls know the story of the magnificent Logan Elm, at Circleville, Ohio—where, in 1774, after a series of bloody battles, a treaty was held by Dunmore and Chief Cornstalk, of the Shawnees, and Logan, chief of the Mingo tribe. Logan, declining to be present at this treaty, sent a message which was read before the assembled red and white men. This message is considered a classic of oratory. The tree is owned and cared for by the State of Ohio.

The first constitution of Indiana was framed under a great old elm at Corydon; and out in Kansas, near Council Grove, a beautiful elm, more than 110 feet high, shaded General Custer for a night in 1867 while he was on his way with his famous Seventh Cavalry to quell an Indian uprising along the old Santa Fe Trail.

Colonel William F. Cody, the immortal "Buffalo Bill," played in the shade of an elm tree near the old river town of Le Claire, in Iowa, when a boy, and today it stands in his honor. The tree is also known as the "Green Tree Hotel," for it early became the rendezvous for river men who came to Le Claire looking for jobs as river hands. Under its grateful shade they congregated, spread their blankets, and cooked their meals, often making it their home for weeks at a time

New England, of course, has many elms rich in historic tradition. There is the Harrington Elm at East Lexington, Massachusetts, planted by the father of Jonathan Harrington, the last survivor of the Battle of Lexington; there is the Lafayette Elm at Ware, Massachusetts, where the general rested his troops in Revolutionary times. Maine also has a Lafayette Elm, near Kennebunk, where the great Frenchman liked to lunch when he returned to America after the war for independence was won.

Among the trees in historic Concord, Massachusetts, are two old elms in front of the Louisa May Alcott house. Under their shade once lived the author of "Little Women." The great elm at Sheffield, Massachusetts, one of the most beautiful in New England, was greatly loved by Oliver Wendell Holmes, and was closely associated with his life.

These are only a few of the great elms that are written into American history and tradition. There are many others—the old elm at Oberlin, Ohio, for example, which shaded the log cabin from which Oberlin College grew, or the beautiful Whittier Elm, at Haverhill, Massachusetts, which marks the great poet's birthplace—trees of glory, every one of them.

The elm belongs to America more than any other tree, with the possible exception of the redwood and sequoia. It was the first tree to meet the eyes of the Pilgrim Fathers when they landed on American soil; its wood sheltered them, fired their first ovens, from it was fashioned their furniture, it shaded them, beautified their landscapes. But more than that the elms recorded their deeds, served as monuments to their heroes—and to the heroes that followed them. They are truly America's trees of glory.

TREES AND THEIR USES

No. 13 - - - PITCH PINE

PITCH PINE IS FREQUENTLY A GNARLED, IRREGULAR TREE, FIFTY TO EIGHTY FEET HIGH. IT GROWS IN THE EAST FROM NEW BRUNSWICK TO GEORGIA, WESTWARD TO ONTARIO AND KENTUCKY. THE YOUNG TREE HAS A ROUNDED, SYMMETRICAL HEAD, BUT AGING, ITS SYMMETRY IS LOST. ITS HORIZONTAL LIMBS ARE FREQUENTLY CONTORTED AND THE GENERAL APPEARANCE OF THE TREE MAY BE GROTESQUE. THE NAME PITCH PINE COMES FROM THE LARGE AMOUNT OF RESIN CONTAINED IN THE BUDS BRANCHES AND INNER BARK.
PINE KNOTS AND CANDLE WOOD ARE FAMILIAR WORDS IN THE REGIONS WHERE PITCH PINE IS FOUND, WHERE KINDLING WOOD AND TORCHES FOR MIDNIGHT COON HUNTS ARE NEVER LACKING. BECAUSE OF THIS, THE TREE IS SOMETIMES CALLED TORCH PINE. NO MATTER HOW DESOLATE THE SPOT—WHETHER IT BE A SANDY UPLAND, A COLD SWAMP, OR THE SHIFTING SAND DUNES OF THE COAST—THE PITCH PINE SERVES AS A WINDBREAK OR SHELTER FOR OTHER FOREST GROWTH AND RELIEVES THE MONOTONY OF THE LANDSCAPE. THE WOOD OF PITCH PINE IS COMPARATIVELY WEAK AND OF LITTLE COMMERCIAL VALUE BECAUSE THE STICKY RESIN GUMS SAWS, CAUSES TROUBLE IN THE MILLS AND RESISTS PAINTING. IT IS USED MOSTLY FOR FUEL, CHARCOAL AND CHEAP CONSTRUCTION

PITCH PINE

Pinus rigida Miller

PITCH pine belongs to the group of hard pines, and is the only three needled pine of the northeastern states. Its wide, scraggy top is common to the rougher, sterile slopes, and is occasionally found in swamps from northeastern Maine to northern Georgia, west along the slopes of the Alleghenies through eastern Tennessee, Kentucky, Ohio, Pennsylvania, and New York to the eastern Great Lakes and the St. Lawrence River.

Trees from forty to fifty feet high and one to two feet in diameter are common, while broad crowned individuals of about 200 years may attain heights of eighty to 100 feet with a trunk up to thirty inches in diameter. In youth pitch pine is fairly symmetrical, but with age the wide crown may become irregular or even scraggy and grotesque. It is generally considered a slow growing tree, for where other pines mark each season's growth with a single whorl of branches and one growth ring, pitch pine may put on two or sometimes three whorls of branches, and as many growth rings in a single year. Few trees of the eastern states have been studied less than pitch pine, but reports from Pennsylvania indicate that trees will attain a height of fifty feet in as many years. With increasing age the growth slows down so that at one hundred years the tree may be seventy-five feet high, and about eighteen inches in diameter.

The hardy pitch pine assumes an unconventional form with age, and ordinarily attains heights of fifty to eighty feet with trunk diameters at breast height of about two feet.

The Latin name *rigida* refers to the stiffness of the wide spreading, sharply pointed, yellowish green needles which are often twisted and two and a half to five inches long. They are usually in clusters of three, with exceptional clusters of two. Each leaf stands out almost at right angles to the twig where it remains two years, and the trio are bound at the base by a fibrous sheath.

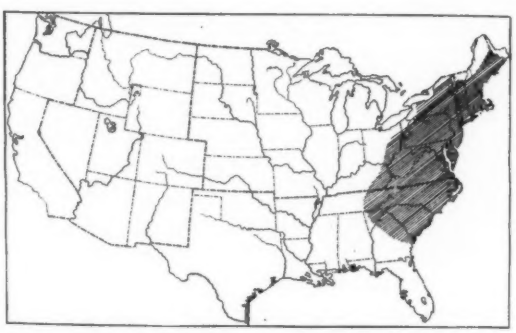
In April or May clusters of yellow, cylindrical, staminate flowers are produced at the base of the new season's growth, and send forth clouds of yellow pollen. More or less simultaneously with these, pistillate flowers appear as individuals or in clusters along the sides of the new twigs. Two years after fertilization, these mature as two to three inch, dark

green, pointed cones closely attached to the parent stem, and may remain on the tree for years. Each cone scale is broadly thickened at the end and armed with a stout recurved prickle. In the fall or winter, the cones may open to release many brown, winged seeds, so small that 65,000 to 75,000 are required to make a pound. Because the cones frequently hang on several years before opening, the crown may be filled with cones of varying ages. Pitch pine seed that are shed in midwinter are sometimes an important source of food for squirrels, quail, and small birds. While primarily dependent upon seeds for reproduction, vigorous stump sprouts will grow to merchantable size. This ability to produce sprouts has been observed in trees up to four to eight inches in diameter.

On young trees and branches the rough bark is broken into reddish brown scales, while on mature trees it is deeply furrowed and broken into large irregular plates. It is so resistant to fire that the bark may be severely blackened and scarred for several feet above the ground. Clusters of leaves and short branches, known as "water sprouts" may be produced along the trunk and main branches, which, like the ability to reproduce from stump sprouts, is unique among northern pines. Such considerable quantities of pitch flow when the bark is broken, and are contained in the wood, that at one time logs and branches were destructively distilled for naval stores as far north as Pennsylvania. This is no longer done to any extent, but the name "pitch pine" continues.

The soft, coarse grained, yellowish wood is only moderately strong and full of resin. It weighs about thirty-two pounds to the cubic foot, and is used for rough construction, mine props, fencing, fuel, pulp, crating, and railroad ties. When grown under favorable conditions the wood is of good quality and as valuable as that of the other eastern hard pines, but no estimates of the present stand or total annual production are available.

Pitch pine has few enemies, has remarkable resistance to fire, and no pine east of the Mississippi River maintains itself under such unfavorable conditions. It is not demanding as to soil or moisture, and will grow under a variety of soil and climatic conditions. Accordingly, it is frequently found on dry, burned-over, gravelly slopes, on rocky cliffs at high elevations and also in swamps. Best growth is frequently found when the trees grow in mixture with hardwoods. It can be established either directly from seed or by means of nursery grown seedlings and transplants. While of no value for street planting, the contorted forms occasionally lend themselves to landscape purposes.



Natural range of pitch pine in the United States.

The stiff, yellow green needles are usually in clusters of three, while the scales of the broad based cones have thick ends, each armed with a short recurved prickle.

Deeply furrowed reddish brown bark sometimes an inch and a half thick and highly fire resistant is found on mature pitch pine trees.

AROUND THE STATES WITH THE AMERICAN FORESTRY ASSOCIATION

FOREST SERVICE ISSUES SHELTERBELT REPORT

With the appropriation of funds for continuing the prairie shelterbelt project hanging in the balance, there has come from the government printing office a voluminous and exhaustive report on past experiences in shelterbelt plantings in this and other countries. It is a report of two hundred printed pages liberally illustrated with photographs and charts. Its fourteen separate sections have been prepared by specialists in different scientific fields related to the planting of trees for shelterbelt purposes. Entitled "Possibilities of Shelterbelt Planting in the Plains Region," the report was prepared under the direction of the Lake States Forest Experiment Station of the United States Forest Service.

Congress is now trying to determine whether or not this New Deal project, announced early in President Roosevelt's administration with fantastic plans and initiated with drought relief money, shall be continued with a regular appropriation of $1,000,000. This sum was recommended by the Bureau of the Budget but struck out by the House. It was later restored by the Senate and the moot item now rests in the laps of the Senate and House conferees on the Department of Agriculture appropriation bill.

Regardless of the fate of the appropriation or the project, the report just published by the Forest Service brings together for the first time world information on human efforts to establish tree shelterbelts in exposed and largely treeless regions. It, therefore, supplies highly valuable and useful information. Its first chapter is a brief statement by Chief Forester F. A. Silcox of the problem of shelterbelt planting in the plains region of the United States. Mr. Silcox does not specifically commit himself on these possibilities but it is clear that he believes past experience fully justifies the government's effort to ameliorate conditions in the plains states by tree planting and that these activities have an important place in working out the land-use problems of the region.

"The report," he states, "has been prepared with the conviction that full and wise use of our whole land resources is vital to the future welfare of the region and the nation, and with the recognition that shelterbelt development is only one phase of plains management, a phase that must be developed in harmony with the entire land-use pattern of the region." The Forest Service task of carrying out the shelterbelt program, he divides into two parts—the investigative or exploratory phase, and the administrative phase, concerned with the actual execution of the work.

Confronted with the question, "Can shelterbelts be established successfully in the plains region, and if so, where is such establishment most feasible, and where will it accomplish the greatest good," he points out that it was necessary for the Forest Service during 1934 and 1935 to investigate climate, soils, native vegetation and results of past planting in the prairie-plains region of North Dakota, South Dakota, Nebraska, Kansas, Oklahoma and Texas. The results of these investigations formed the basis of active planting operations begun in the spring of 1935. During that field season, he reports that 125 miles of field shelterbelts were planted in strips eight rods wide, and that in addition 4,800 acres were planted around farmsteads, making a total of 6,800 acres, or more than all plantings within the plains region during the preceding decade. Plans for the 1936 season contemplate the planting of 30,000 acres more in the form of 1,400 miles of field shelterbelts and 6,400 acres of farmstead plantations.

"Expanded planting operations must be guided at every step by specific experimental activities," Mr. Silcox declares. "The suitability of soils for individual plantings must be determined. A quantitative expression of the effect of shelterbelts on climatic factors and crops, under different conditions, must be sought. Experimental plantings must be established for determining more accurately the proper orientation, width and structure of shelterbelts, and the intervals at which planting, as it assumes its final pattern in different parts of the region, will be most effective for protection. * * * It is highly undesirable at this stage that the program of shelterbelt development be cast in any rigid mold. On the contrary, our policy should be sufficiently flexible to take advantage of changing conditions and increasing knowledge. The outlines of the situation are sufficiently clear so that the program herein recommended can be presented with full assurance that it is justified and, in fact, essential for the public welfare."

JAMES T. JARDINE

Newly appointed Director of Research for the United States Department of Agriculture. **(See page 231.)**

The second section of the report is entitled "What the Study Discloses" and has been prepared by Raphael Zon, Director of the Lake States Forest Experiment Station. In summarizing, Mr. Zon states that shelterbelt planting is not a cure-all of unfavorable climatic conditions in the plains region. "It should be considered," he says, "as part of a much broader program of water conservation, soil erosion control, terracing, strip cropping and other measures tending to hold moisture and to conserve it in the soil." Further investigations, particularly into the effects of shelterbelts on crop yields and physical factors, he states, should be carried on and for this purpose, recommends the establishment of a great plains forest experiment station. He advocates that the great plains should be organized as a distinct forest region to the end that shelterbelts may be permanently planned and encouraged on suitable sites both within and outside the present shelterbelt zone.

The writer defines the shelterbelt zone of the prairie states as a strip 100 miles wide and 1,150 miles long, confined to the transition zone between the tall-grass prairie and the short-grass plains. Its western limit, he states, is generally determined by the limits of the sixteen inch rainfall in the north and the twenty-two inch rainfall in the south. This zone is given as embracing 114,700 square miles of land within which approximately 40,000 square miles contains soils unsuited or unfavorable to the establishment of tree shelterbelts.

In a section entitled "The Proposed Tree Plantations," prepared by D. S. Olson and J. H. Stoeckeler, both of the Lake States Forest Experiment Station, the scheme of planting within the shelterbelt zone is described. "The typical field shelterbelt," the writers state, "will be a planted strip eight rods (132 feet) wide, comprising sixteen acres in the length of one mile. The area of land to be acquired, however, will be ten rods wide, so as to provide on each side the space needed for cultivation and for the spread of the roots and crowns of the trees. There will thus be twenty acres in each mile of strip. The strip will be adequately fenced. It is estimated that 1,282,120 acres, all on favorable soils, will be planted to field shelterbelts." On more difficult soils, the plan is to aid farmers to plant an additional 900,000 acres. Approximately 4,000,000 acres of land within the shelterbelt zone is recommended for forest and range management, of which about 400,000 acres should be planted more or less solidly for watershed protection, timber production and other uses. The total acreage within the six prairie states proposed for shelterbelt and farmstead plantings is given as 1,282,120 acres and 897,880

INDIANS badly needed here. Many lives and thousands of dollars worth of property are saved annually by use of INDIAN fire pumps.

Spring Means Grass Fires . . . and Grass Fires Mean a Need For INDIAN FIRE PUMPS

A WARM sun, dry grass, carelessly thrown cigarette butts, a small grass fire rapidly growing into a big one—then's when you need INDIAN FIRE PUMPS. One INDIAN can do the work of a dozen men with brooms, rakes, and other improvised implements.

These nationally known fire pumps have won the reputation of being the world's finest forest and grass fire fighters. Every part has been designed and constructed to produce the most efficient extinguisher that can be built.

Check your supply of INDIANS now and order promptly to be prepared.

Truck Carrying Rack

Carrying rack of unbreakable malleable iron which bolts to running board or floor of truck makes outfit complete. Straps hold pump in place. Instantly locked or unfastened for use.

USES ONLY *Clear* WATER

If you are now equipped with INDIAN FIRE PUMPS you realize their outstanding merit as fire fighting equipment. If not you have but to use one once to know why forest rangers, fire departments, C.C.C. officials, farmers, campers and out door men pronounce them the best all 'round fire pumps they ever saw. Our files contain testimonials from all over the country, copies of which will be sent you upon return of the coupon at right.

Manufactured by

D. B. SMITH & CO., 405 Main St., UTICA, N. Y.

Pacific Coast Agents
Hercules Equip. & Rubber Co. Pacific Marine Supply Co.
550 Third St., San Francisco, Cal. 1217 Western Ave., Seattle, Wash.
Western Loggers' Machinery Co.
302 S. W. 4th St., Portland, Oregon

Mail Coupon TODAY!

D. B. SMITH & CO.,
405 Main St., Utica, N. Y.

Please send us illustrated catalog and testimonials on your INDIAN FIRE PUMPS.

Name.....

Address.....

City..... State.....

• For every job in the protection, preservation and management of the forest there is a dependable True Temper Tool.

THE
AMERICAN FORK & HOE COMPANY
CLEVELAND, OHIO
Makers of Essential Tools

Write today for 32-page Handbook describing this famous line of essential tools. It's free.

acres respectively, or a total of 2,180,000 acres.

The sections of the report describing past plantings in the prairie states and the shelterbelt experiences of other countries are particularly interesting and illuminating. It is stated that in the shelterbelt zone of the prairie region some 230,000 acres "appear to have been more or less successfully planted in the past fifty years." Considering the poor care which characterized these plantings the results shown are considered significant. In the experience of other countries with the planting of shelterbelts, the report finds Russian conditions most applicable to this country. "While it is not the purpose of the writers to recommend any blind following of foreign methods," the report states, "American foresters will do well to consider very seriously Russian experience and practice in regard to the layout of shelterbelt areas, dimensions and spacing of units, density of planting and species composition of shelterbelt." As to the good effects of the shelterbelt on its surroundings, Russian observations of wind velocity, humidity, evaporation, soil moisture, soil fertility and even precipitation point with truly remarkable accord to the shelterbelt's practical ameliorative value.

Other sections of the report deal more or less exhaustively with "The Shelterbelt Zone," by F. A. Hayes of the Bureau of Chemistry and Soils, "Land Acquisition," by L. F. Kneipp and A. A. Simpson of the Forest Service, "Prospective Effects of the Tree-Planting Program," by Raphael Zon, "Economic and Social Aspects of Agriculture in the Plains Region," by M. L. Wilson, Assistant Secretary of Agriculture, "Climatic Characteristics of the Plains Region," by C. G. Bates of the Lake States Forest Experiment Station, "Soil and Forest Relationships of the Shelterbelt Zone," by F. A. Hayes and J. H. Stoeckler, "Native Vegetation of the Region," by J. M. Aikman, of the Lake States Forest Experiment Station, and "Ground-Water Conditions of the Shelterbelt Zone," by G. E. Condra, State Geologist of Nebraska.

EXPANSION OF SUPERIOR NATIONAL FOREST APPROVED

After approving the purchase of 259,782 acres of forest land in twenty-two states and obligating all remaining funds, the National Forest Reservation Commission approved on April 2 the extension of the boundaries and the purchase area of the Superior National Forest in Minnesota to include all the border lakes and territory comprehended in the Shipstead-Nolan Act of July 10, 1930.

The extended areas include the 80,000 acre Grand Portage State Forest extending east to the Grand Portage Indian Reservation, the 661,000 acre Kabetogama State Forest on the west of the previously established Superior National Forest. No actual purchase of lands within these areas was authorized at this meeting, and no plans are contemplated for taking over the lands now owned by the State.

These two state forests were created by an act of the Minnesota State Legislature in 1933, three years after the passage of the Shipstead-Nolan Act. In April, 1934, the National Forest Reservation Commission tentatively approved extending the Superior National Forest into these areas, but after repeated consideration agreed to defer its decision until the State Legislature might act. At the recent special session of the Legislature the matter was not considered, and in a letter to the commission, Governor Olson recommended the action taken.

As the lands along the border lakes within these added areas are acquired by the Federal Government, the Shipstead-Nolan Act will become operative to preserve the levels of the various lakes and water courses, and maintain the established program of forest management. Ernest C. Oberholtzer, President of the Quetico-Superior Council, has also pointed out that it marks progress toward the creation of a great international playground to include the Quetico Provincial Park in Canada.

Of the other purchase areas approved by the Commission on April 2, nearly one-half are in Michigan, Wisconsin and Minnesota; over 80,000 acres are in the southern forests, and nearly 40,000 acres in the Appalachian Mountain Range.

A tract of 320 acres of heavily timbered land in the heart of the Sequoia National Forest in California was authorized for purchase at $7,000, and 22,819 acres were approved as additions to existing National Forests in Utah, in order more to effectively control erosion.

NAVIGABILITY OF NEW RIVER TO BE TESTED

A legal case which may have an important bearing upon the government's acquisition of forest lands under the Weeks Act is scheduled for a hearing in July in the United States District Court of Virginia. It is the case of the United States against the Appalachian Electric Power Company, a public service corporation of Roanoke, Virginia. The government is seeking to enjoin the company from building a dam across the New River near Radford, in Pulaski County, Virginia, for the impounding of water and the generating of hydro-electric power.

The major point of issue is the navigability of the New River and the decision of the court, if it is adverse to the government's claim, may be a precedent in determining the navigability of a number of other rivers on whose watersheds the government has been buying lands for National Forest purposes as authorized under the Weeks Act. It is expected the case eventually will be carried to the Supreme Court.

According to the government's bill of complaint, the power company has ignored and violated the Federal Power Act by refusal to obtain a license or authority from the United States Government for the construction of the dam in question. It has proceeded with construction work under a license issued by the State Corporation Commission of Virginia, taking the position that the New River is not a navigable stream and that therefore its project does not come under the authority of the Federal Government. The government, on the other hand, holds that the New River is navigable waters of the United States within the definition of the Federal Power Act and that it has been navigable since colonial times. It will cite much evidence in support of this assertion, including a report by former Chief Justice John Marshall, who in 1812 was a member of a Virginia commission to study the navigability of certain waters of that state.

Under the Weeks Act of 1911 the Federal Government was authorized to purchase forest lands on the watersheds of navigable rivers for the purpose of improving and protecting navigation. Over 50,000 acres have been purchased at the headwaters of New River and form part of the Unaka National Forest. If the courts should decide that the New River is not navigable waters, the status of these and other forest purchases on watersheds or streams similar to New River will be interesting to consider.

59,000 Visit National Forests

In 1935, more persons than ever before made use of recreational opportunities in the National Forests, according to the Forest Service.

The estimate of National Forest visitors, including transient motorists, reached the peak figure of 58,548,000. Although the estimates include many duplications, since there is no practical way to determine the number who make repeat visits or pass through more than one National Forest, it is believed that the estimated figures are a reliable index of the volume and trend of public use of National Forests for various types of outdoor recreation.

Located in almost three-fourths of all the states and embracing a total land area of more than 163,000,000 acres, the National Forests include areas within convenient motor travel range of the greater part of the population. They are also the major areas that are publicly owned and available for outdoor recreational use. Increased expenditures for unemployment relief work the last few years have made possible a material extension of roads and trails in the National Forests.

Garver Heads Forest Survey

Raymond D. Garver, formerly in charge of selective logging investigations and related utilization projects at the Forest Products Laboratory at Madison, Wisconsin, has been apointed to head the nation-wide forest survey by the Forest Service. Mr. Garver succeeds C. M. Granger who recently became assistant chief of the Forest Service, in charge of National Forest administration.

The forest survey is an activity of the Division of Forest Economics. It was authorized by the McSweeney-McNary Act of May 22, 1928. Work started in 1930. It includes an authoritative nation-wide inventory of the extent, location, and condition of forest lands; the quantity, kinds, quality, and availability of timber now standing on these lands; the rate of depletion through cutting, fire, insects, disease, and other causes; the current and probable future rate of timber growth and the productive capacity of forest area; and the present and probable future need for forest products in the different parts of the country by all classes of consumers, including many major industries. It also includes analysis of the relation of these findings to one another and to other economic factors as a basis in formulating policies, principles, and plans of forest land utilization. It involves both field inventories and the adjustment and compilation of existing data from many sources.

The survey is being conducted in the South, Lake States, Northern Rocky Mountain region, the Pacific Northwest, and California. Field work has been completed in the Douglas fir region of the Pacific Northwest, and for the States of Minnesota, Michgan, Louisiana, and Mississippi. Preliminary reports are being issued by the Experiment Stations under whose direction the project is carried on in the several regions.

Mr. Garver is a graduate of the forest school at the University of Nebraska, and obtained a master's degree in forestry at Iowa State College. He has been with the Forest Service since 1910, and has had a varied experience in research, administrative and technical positions. Up to 1925 he was employed in the Rocky Mountain region as director of the Wagon Wheel Gap Experiment Station, Forest Supervisor and Regional Inspector and had special assignments in land classification, timber and grazing management.

May through September

IS DELIGHTFUL THROUGHOUT THE NORTHERN SOUTHWEST

For half a thousand miles the Santa Fe crosses the craggy highlands of northern New Mexico and Arizona, at from 5,000 to 7,500 feet above the sea.

◆

There is no finer spring-summer-fall vacation climate anywhere. The air of the golden days and crisply cool nights is clear, dry, *supremely healthy.*

◆

This, too, is Spanish, Indian, dude ranch country; the land of the Grand Canyon, Mesa Verde, the Rainbow Bridge. In short, ideal for a stopover en route to the Coast, or for one's whole vacation.

◆

Some point trips for the Snake Dance, Gallup Indian Ceremonial, or Santa Fé Fiesta. Others set aside days or weeks for the informal charm of La Fonda, in cool old Santa Fé, from which private motor cruises of any length can be arranged. Many have discovered the new economy of shipping along their own cars.

◆

In tune with the times, Santa Fe presents its lowest summer fares; faster schedules; Fred Harvey meal service; and the fresh cleanliness of air-conditioned trains.

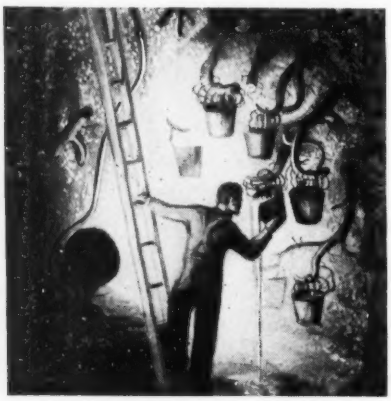
◆

It will be a pleasure to send booklets or to answer specific inquiries of any sort.

W. J. BLACK, Passenger Traffic Manager, Santa Fe System Lines
975 Railway Exchange, Chicago, Illinois

Santa Fe

A SURE WAY to Speed Root Growth of Transplanted Trees



A REMARKABLE soil conditioner is helping to speed growth of transplanted trees. It's Emblem-Protected Peat Moss. This amazing product—made up of millions of tiny sponge-like cells—mechanically breaks up hard and clay-like soils and gives body to sandy soils. It also aerates the earth, readily contributes humus, absorbs and stores up moisture and plant food for the development of a vigorous root system.

No other material induces the same degree of root stimulation. The fibrous water-absorbing roots are quickly regenerated and the trees or shrubs are given a real chance to develop rapidly.

Another advantage in using Emblem-Protected Peat Moss is that its humus-making qualities are definitely superior. Its behavior in retaining and making available nitrogen is outstanding. Fill in and mail the coupon for full facts covering these vital points of superiority found only in P.I.C. Peat Moss bearing the Triangle.

Emblem-Protected
PEAT MOSS

FREE TEST TABLETS AND VALUABLE BOOKLETS

This tiny peat tablet will dramatize the moisture-absorbing property of Emblem-Protected Peat Moss.

PIC

PEAT IMPORT CORPORATION,
Educational, Advertising and Research Dept.,
155 John Street, New York, N. Y.

AF5-36

Please send me your free Peat Moss literature and absorbency test tablets.

Name .....

Address .....

City ..... State .....

Reserve a Place Now With the Trail Riders

With organization of the 1936 Expeditions of The American Forestry Association's Trail Riders of the Wilderness completed, those desiring to take advantage of this unusual opportunity to spend vacations in wilderness areas under organized leadership are urged to make reservations immediately. There are places in the five expeditions this summer for only 115 riders, and many of these have already been reserved.

As all expeditions are conducted on a non-profit basis, the cost of each trip is exceptionally low. The cost of Expedition No. 1, July 9 to July 20, Flathead-Sun River Wilderness of Montana, is $100; Expedition No. 2, July 30 to August 10, the Wind River Wilderness of Wyoming, $145; Expedition No. 3, August 1 to August 13, Gila Wilderness of New Mexico, $115; Expedition No. 4, August 15 to August 24, Gila Wilderness of New Mexico, $95; Expedition No. 5, August 13 to August 26, the Olympic Wilderness of Washington, $150.

A new folder is now available setting forth these expeditions in detail. Write The American Forestry Association, 1713 K Street, N. W., Washington, D. C., for one.

EXTEND ELM DISEASE CONTROL

Extension of the Dutch elm disease quarantine to include twenty-six new townships in New Jersey and thirteen new towns in New York was anounced March 31 by Secretary of Agriculture Henry A. Wallace.

This extension, effective April 1, was made necessary by the finding in the new areas of a small number of trees which had become diseased. Any recent spread of Dutch elm disease which may have occurred cannot be definitely known until scouting starts again as the trees come into leaf, according to Lee A. Strong, chief of the Bureau of Entomology and Plant Quarantine, who is in charge of the department's campaign to save the American elm from destruction by this disease.

The following territory is added to the area previously regulated:

New Jersey—Townships of Bethlehem, Clinton, Franklin, Lebanon, Readington, Tewksbury and Union, in Hunterdon County; township of Madison, in Middlesex County; townships of Holmdel, Matawan and Raritan, in Monmouth County; townships of Mount Olive and Washington, in Morris County; townships of Hardystown, Lafayette, Sparta, Vernon, and Wantage, in Sussex County; townships of Allamuchy, Franklin, Hope, Independence, Mansfield, Oxford, Washington, and White, in Warren County.

New York—Towns of Blooming Grove, Chester, Highland, Monroe, Tuxedo, Warwick, and Woodbury, in Orange County; towns of Carmel, Philipstown, Putnam Valley, and South East, in Putnam County; towns of Lewisboro and North Salem, in Westchester County.

The area previously regulated included the following cities, towns, boroughs, or other political subdivisions:

Connecticut—Towns of Darien, Fairfield, Greenwich, New Canaan, Norwalk, Stamford, and Westport, in Fairfield County.

New Jersey—Counties of Bergen, Essex, Hudson, Passaic, Somerset and Union; townships of Princeton and West Windsor, and the city of Princeton, in Mercer County; townships of East Brunswick, Lincoln, Milltown, North Brunswick, Piscataway, Raritan, Roosevelt, Sayreville, South Brunswick, South River, and Woodbridge; boroughs of Dunellen, Highland Park, and Metuchen, and cities of New Brunswick, Perth Amboy, and South Amboy, in Middlesex County; townships of Boonton, Chatham, Chester, Danville, Hanover, Jefferson, Mendham, Montville, Morris, Passaic, Pequannock, Randolph, Rockaway and Roxbury, boroughs of Dover, Florham Park, and Mendham, and cities of Madison and Morristown, in Morris County.

New York—Counties of Bronx, Kings, Nassau, New York, Queens, Richmond, and Rockland; towns of Bedford, Cortlandt, East Chester, Greenburg, Harrison, Mamaroneck, Mount Pleasant, Mount Vernon, New Castle, New Rochelle, North Castle, Ossining, Pelham, Poundridge, Rye, Scarsdale, Somers, White Plains, Yonkers, and Yorktown, in Westchester County.

BULL ISLAND MADE BIRD REFUGE

Bull Island near Charleston, South Carolina, has been bought by the Biological Survey for a bird refuge. The island is part of a land-and-water tract of about 7,700 acres which has been added to the 55,000-acre Cape Romain Migratory Bird Refuge, in South Carolina. The new purchase brings the water frontage of Cape Romain Refuge to about twenty-five miles.

Except as a haven for wildlife, for which it is well adapted, Bull Island has had an unprofitable history over 250 years. In colonial days it was famous as a pirate haunt. During the Revolution it was raided by the British. It was repeatedly a failure as a cotton plantation before becoming a timber reserve. A wooded hill ten miles long and four miles wide on an average, the island is some eighteen miles northeast of the port of Charleston. The deep Atlantic lies off its outer shore. The inner shore overlooks a waste of marsh grasses and tidal currents out of which, after some miles, solid farming land emerges.

Jardine New Agriculture Research Head

Appointment of Dr. James T. Jardine as director of Research for the United States Department of Agriculture was announced March 24 by Secretary Wallace. Dr. Jardine has served as chief of the Office of Experiment Stations in the Department since September 15, 1931, and will continue in this capacity.

As chief of the Office of Experiment Stations and director of Research. Dr. Jardine will be responsible for three major activities. He will continue in charge of the Office of Experiment Stations, which administers Federal grants to the states and territories for the agricultural experiment stations, and coordinates this work with similar research of the Department. As director of Research for the Department, he will cooperate with the bureaus in planning and coordinating their research work. As a third function, he will have general administration of a Special Research Fund made available by the Bankhead-Jones Act, approved June 29, 1935, including the planning and coordination of the research program under this fund.

Dr. Jardine, a native of Idaho, was graduated from the Utah Agricultural College in 1905, after which he did special work at the University of Chicago. He then returned to the Utah Agricultural College as instructor in English.

In 1907 he became a special agent for the Forest Service. He was Forest Supervisor from 1908 to 1910 and Inspector of Grazing, in charge of the National Forest Range Investigations and Range Surveys from 1910 to 1920, when he became director of the Oregon Agricultural Experiment Station.

Forest Plantings Acceptable for Federal Payment

The new national soil conservation program for 1936 as approved by Secretary Wallace on April 1 for the North Central Region will permit the payment of $5 an acre for plantings of forest trees when established on crop land or pasture land between January 1, 1936, and September 30, 1936. These payments are the highest of any of the soil building program and the plantings must be established in accordance with approved recommendations of state forestry authorities but cannot be made when the labor, seed, or materials are furnished free by any state or federal agency.

The entire soil conservation program contemplates shifting some 30,000,000 acres of commercial crop land to grasses, legumes and forest trees at an estimated cost of $470,000,000 during the present year. The North Central Region program, which is the first to receive approval from Secretary Wallace, contemplates shifting about 9,000,000 acres into soil saving or soil building crops for which the cooperating producers may be rewarded to the extent of between $80,000,000 and $100,000,000.

Programs for the other regions are now being formulated, and the question has arisen regarding the possibility of extending rewards to farm owners who fence their woodlands against grazing, as well as to those who carry on weedings, thinnings, and improvement cuttings of an authorized nature within existing woods.

The Administration contemplates no contracts with farmers and the soil improving practices on which payments will be made will be worked out in cooperation with state committees. In conclusion, Mr. Tolley has said that no payment will be made on any farm unless there has been positive action which results in additional soil building or soil conservation on the farm.

What does the
MONITOR SAY?

"Here's what the Monitor says . . ." and eager ears give heed—alert eyes take in the story. It may be a speech delivered, a crisis averted, an ultimatum issued, a discovery announced. Whatever the happening, the account of it is not complete for a growing number of alert, interested readers, until it has been read in The Christian Science Monitor.

What the Monitor says is important because it is based upon one of the great independent news-gathering organizations of the world. Monitor treatment of news, whether reportorial or editorial, is always in proportion to the significance of the event. This ability to sift news to the very essence, to present it differently and interestingly—vigorously, if need be—makes every story in the Monitor vital,—whether of an event that has stirred the world or some trifle selected for its human interest, from some out of the way place.

Monitor readers expect great things of the Monitor. Perhaps you, too, are seeking a newspaper of its journalistic vision and value. Big news is breaking—in Europe, Africa, the Orient, and at home. It is a good time to become acquainted with the Monitor—and the coupon below is a convenient and economical way. Invite the Monitor to your home for six weeks at the special offer of $1.

THE CHRISTIAN SCIENCE MONITOR
An International Daily Newspaper
Published by The Christian Science Publishing Society
Boston, Massachusetts

THE CHRISTIAN SCIENCE MONITOR
Dept. AF-5, One, Norway Street, Boston, Massachusetts

Please send The Christian Science Monitor to the address below for six weeks (36 issues) beginning at once. I enclose $1.00.

Name.....

Address.....

Price of Regular Monitor Subscriptions		The Wednesday Issue Only, Including the Magazine Section	
☐ 1 month	$0.75	☐ 1 year	$2.60
☐ 3 months	2.25	☐ 6 issues	.25
☐ 6 months	4.50		
☐ 1 year	9.00		

NEWEST big-game rifle—the world's most efficient development in lever action—superbly styled, intensely modern in shooting fit and ease of handling, with corresponding high velocity, great energy and fine accuracy—completely right for ALL North American big game—the new Winchester Model 71 is here. To many a hunter it will be the universal—*one best*—rifle.

Model 71's coming celebrates the Golden Jubilee and honored retirement of the famous Winchester Model 86, for 50 years America's fastest, smoothest, strongest lever-action big-game rifle. It carries the efficiency and success of that famous rifle on ahead into a new modern sphere of service.

With the new Super Speed .348 caliber Winchester cartridges, developed expressly for it, Model 71 far outguns the famous .33 caliber Model 86 Winchester. Choice of 150-grain and 200-grain soft-point bullets, with muzzle velocities of 2920 and 2535 f.s. respectively and muzzle energies of 2840 and 2860 f.p. That's over 30% more power than is delivered by the .33 Winchester. Great dependable killing power. And fine accuracy.

Examine this new Proof-steel, 5-shot, lever-action Winchester at your dealer's. New-dimensioned shotgun stock and new semi-beavertail forend. New 86 Golden Jubilee improved smoother and faster action with finest lever-action trigger pull. New better sight equipment and new non-rattling, quick-detachable sling. For FREE pamphlet with complete description, pictures, comparative ballistics, write Dept. 26-C,

WINCHESTER REPEATING ARMS CO.
NEW HAVEN CONN., U. S. A.

FORESTRY IN CONGRESS

By G. H. COLLINGWOOD

As this goes to press, the Agricultural Appropriation bill, H. R. 11418, as amended and passed by the Senate on March 24, is awaiting action by the conferees appointed by the two houses of Congress.

Senate additions of $13,676,139 to the Forest Service include increases which, if approved, will bring the total appropriation to the Forest Products Laboratory at Madison, Wisconsin, to $1,000,000 as authorized in the McNary-McSweeney Forest Research Act of 1928. The shelterbelt project was restored to the original $1,000,000 recommended by the Budget Bureau, and a new item of $10,000,000 was included for the acquisition of forest lands under the Weeks Act of 1911 as amended by the Clarke-McNary Act of 1924. Of this sum $5,000,000 would be immediately available upon approval of the Act. The bill contains no mention of land purchases in cooperation with the states under the Fulmer Act.

These and other items, including $250,000 for continuing the forest survey, $1,731,382 for cooperation with the states in forest fire prevention and suppression under the Clarke-McNary Act, $129,295 for investigations in forest economics will be considered by the conferees and submitted to the two houses for approval. The total appropriation for the Forest Service as recommended by the Senate equals $27,576,572 as compared with $13,899,333 as passed by the House.

The Senate also recommended $3,000,000 for eradication of Dutch elm disease under the Bureau of Entomology and Plant Quarantine, a total of $32,500,000 for the Soil Conservation Service, and $2,108,404 for the Biological Survey. Like the Forest Service items, these are material increases above the amounts as passed by the House on February 27.

The Interior Appropriation bill, including $16,122,080 for the National Park Service and $650,000 for the Division of Grazing also awaits final consideration. The Senate added $62,717,427 to the bill as passed by the House, the bulk of which is included in public works projects of the Bureau of Reclamation. At a public hearing before the House Subcommittee on Appropriations for the Department of the Interior, on March 27, The American Forestry Association protested inclusion of the Grand Lake-Big Thompson Transmountain Diversion Project which would put a thirteen-mile tunnel through the Rocky Mountain National Park in Colorado.

Robert Sterling Yard, representing the National Parks Association and the Wilderness Society, told the committee that approval of the project to tunnel the National Park would put the National Park to commercial use and establish a precedent threatening to open up all National Parks to waterpower, irrigation, and other commercial uses. "In practice," declared Mr. Yard, "Congress cannot deny to other neighborhoods what it grants to any one, and the presumption will hereafter be set up that applicants for power and irrigation dams, conduits, power lines, and other commercial works in any National Park will receive them because Congress has granted them in this one National Park. This rider, if made law, will open a swift way for all commercial uses of water in National Parks, even for the oft denied tunnels from Yellowstone Lake into neighboring ranches in two competing states. Such a bill is now before Congress awaiting the precedent of this rider. This is not a Rocky Mountain National Park problem, but it is the problem of the fate of the National Parks System."

On April 4, Senator Lewis of Illinois presented a proposal to the Senate that S. 2665, "to change the name of the Department of the Interior and to coordinate certain governmental functions," be changed, after the enacting clause to read: "That the Department of the Interior shall hereafter be called and known as the Department of Conservation, and the Secretary of the Interior shall be called and known as the Secretary of Conservation, and all of the provisions and sections of titles IV and XI of the Revised Statutes, including all Acts supplementary thereof and amendatory thereto, are hereby amended accordingly." This was laid on the table and ordered to be printed. No further action has followed.

In view of President Roosevelt's letter of March 20, addressed to both houses of Congress, expressing his intention of appointing a committee to study governmental organization and report early in the Seventy-fifth Congress, and requesting the cooperation of existing Congressional committees, The American Forestry Association has suggested the postponement of action on this and other bills of a similar nature. Since then the President has appointed Louis Brownlow and Charles E. Merriam of Chicago and Luther Gulick of New York City to work with committees appointed by the Senate and House. Meanwhile, Senator Byrd's committee has retained the Brookings Institution of Washington, D. C., to engage in the study.

Hearings on the Lonergan bills, S. 3958 and S. 3959, to prevent pollution of the navigable waters of the United States as conducted under Senator Caraway, of Arkansas, were completed on March 26, and the testimony is being prepared for publication.

Senator McNary, of Oregon, is introducing a revised draft of the Omnibus bill to bring about more effective protection, replacement and sustained production of forest resources in the United States. The bill proposes to strengthen forest protection against fire, insects, and disease, and would amend the Clarke-McNary Law to increase the total authorization for yearly federal appropriations for cooperative protection from $2,500,000 to $6,000,000. It would authorize the Secretary of Agriculture to set up standards for coordinating the management of private and public forest lands on a sustained yield basis, and proposes an authorization of $6,000,000 with which to complete the Forest Survey and keep the data up to date. Annual appropriations of $30,000,000 over a ten year program would be authorized for National Forest acquisition, and the Secretary of Agriculture is directed to study and recommend more equitable methods than now exist for making payments to states and counties in lieu of taxes on the National Forests.

The establishment of the Daniel Freeman Homestead in Gage County, Nebraska, as a National Monument was approved by the President on March 19, when, after passing both houses of Congress, S. 1307, introduced by Senator Norris, became Public Law No. 480 of the Seventy-fourth Congress.

The National Park Service plans that the homestead will become a museum in which the literature, the implements of agriculture, the means of transportation, and other incidents of pioneer life may be preserved and made available for study.

Shelterbelt Planting Goes Forward

Tree planting in the Plains Shelterbelt zone is now progressing at a rate of from thirty to thirty-five miles of 100-foot strip a day, according to the Forest Service. These strips run sixteen acres to the mile and are not continuous.

Planting operations are under way in the four southern states of the zone—Texas, Oklahoma, Kansas, and Nebraska—and will move northward into the Dakotas as the planting season opens.

Land for planting has been donated by the farm owners under voluntary cooperative agreements with the government. Under these agreements, land owners prepare the ground for planting and agree to fence the strips for protection against livestock damage. They also agree to maintain and care for the plantations. The government contributes the nursery stock and the labor for planting.

Location of plantations in each case is that best adapted to protection of farm fields and buildings from damaging winds.

More than 40,000,000 year-old trees, grown by the Forest Service in twenty nurseries leased a year ago, will be planted during the current season. This will total 1,400 miles of strip planting in the six states, plus 7,000 acres of farmstead plantation for the protection of farm homes and buildings. Last year's plantings amounted to approximately 6,500,000 trees. The total cost to the government, including growing the stock and planting the trees in the field, is between two and three cents a tree. It is expected that future costs, with the development of the project, can be lowered to about one and one-half cents a tree.

World Power Conference to Be Held in Washington

Meeting in this country for the first time, the Third World Power Conference will convene in Washington on September 7. The conference will extend through the week and is expected to be the greatest exposition of water resource problems ever held in the United States. It will bring to Washington several hundred eminent authorities from all the important countries of the world.

Although the central theme of the conference will be national power economy, the forthcoming meeting will differ from those previously held in that it will devote its discussions to the more fundamental and important relations of power resources, their development and use, to the social and economic interests of the nation. Heretofore the conference has devoted itself largely to the technical side of power development but the Washington meeting will deal with the question of national power economy in its broader application to social and economic welfare.

Included in its agenda of major subjects to be discussed are: Technical, economic and social trends, public regulation, national and regional planning, conservation of fuel and water resources, organization of fuel, gas and electric industries, rationalization of distribution, and national power and resources policies. In treating these major elements in the national power economies of all countries, the conference will seek to present comparative studies on parallel lines of power problems in the different countries of the world. To this end, each country has been requested to prepare and submit a single national paper under each of the subjects mentioned. The whole meeting is being arranged to appeal to the layman as well as to the engineer, and therefore should be of great interest and value.

This year • ride the trails in
Glacier National Park
GREAT NORTHERN
Trail Riders of the Wilderness!
When you go to the OLYMPICS, take the
Air-Conditioned
Empire Builder

● Where countless waterfalls come shimmering down from 60 sky-born glaciers, to be captured in smiling lakes, of which there are 250 in Glacier Park. Where the camps and trails combine to make a Paradise for those who love the out-of-doors.

Horses and guides and everything you need are waiting in Glacier Park. Wilderness trails that wind in and out among the mountain passes for 900 miles. Glorious vistas beckoning to you from around 10,000 thrilling turns. Cozy chalets . . . tent camps . . . star-lit skies. And all on your direct route westward on the Empire Builder, Great Northern's train of luxury.

Bargain Round Trip Ticket

Make your summer perfect by adding the trails of Glacier Park to the trails of the Olympics. Great Northern offers low round trip tickets, excellent meals at bargain prices, fine tourist sleeping and new type luxury day coaches as well as standard Pullmans; also all-expense tours throughout the west, or in Glacier Park. Send for particulars.

---- *CLIP COUPON TODAY*----

A. J. Dickinson, Passenger Traffic Manager
Great Northern Railway
Dept. AF-3, St. Paul, Minn.

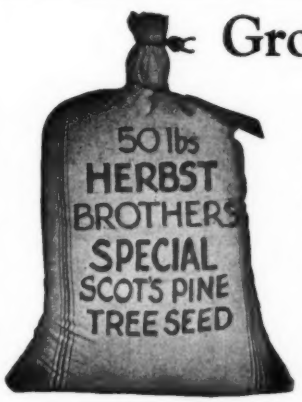
Please send me further information about your travel service; also Glacier Park ☐ Pacific Northwest ☐ Alaska ☐ California ☐ All-Expense Tours ☐

Name ----------

Address ----------

City State

Grow Trees from Seed



Sow about ⅜-inch deep in a protected part of garden or cold frame.

The following varieties are available in 25c Packets (Postpaid in U. S. A.)

Oriental Spruce
Colorado White Fir
White Spruce
Norway Spruce
Austrian Pine
Corsican Pine
Red Pine
Yellow Pine
Pitch Pine
White Pine
Scots Pine
Himalayan Pine
Swiss Mt. Pine

HERBST BROTHERS
Tree and Shrub Seed Specialists
92 WARREN ST. NEW YORK, N. Y.

Rock Island

Highspots of the

SCENIC WEST

COLORADO

YELLOWSTONE

CALIFORNIA

Why Not All THREE In One Vacation

Wide Choice of Routes
Go One Way—Return Another
All the famous National Parks and Forests in one swing 'round the western circle.

AIR-CONDITIONED TRAINS —THROUGH SERVICE

Direct service Chicago to Deming, New Mexico—rail destination of the "Trail Riders of the National Forests" who will visit the Gila Wilderness this summer.

You can afford an unusual outing at the low fares offered this season. Delightful all-expense tours, too—anywhere west. Ask for full particulars.

ROCK ISLAND

Travel by Train for Safety, Comfort, Economy

MAIL THIS COUPON

L. M. ALLEN, Passenger Traffic Manager
Rock Island Lines
701 La Salle St. Station, Chicago, Ill.

Please furnish complete travel information and forward literature on ☐ Colorado, ☐ Yellowstone, ☐ California, ☐ All-expense tours. Check booklets desired.

Name.....

Address.....

1957

President Orders Continuance of C.C.C. at Strength of 350,000

Rescinding his order to abandon 350 camps, issued early in March, President Roosevelt has instructed Robert Fechner, director of Emergency Conservation Work, to retain the 2,158 C.C.C. camps now scattered throughout the nation through March 31, 1937. Companies in each of the camps, however, will be gradually reduced from 200 enrolled members to 163, so that the Corps will be reduced to an enrollment of 350,000. This number will be maintained through the new twelve-month period. No new enrollments were authorized, except to fill vacancies in the ranks of the Corps as they occur.

"In reviewing the Emergency Conservation Work program for the period ending March 31, 1937, at which date the emergency conservation work will terminate according to existing law," the President said, "I have determined that the present number of Civilian Conservation Corps camps shall be maintained, unless such camps are reduced as a result of the completion of the work now being performed by the enrollees of any such camps, or the reduction through discharges, separations or other causes in the number of enrollees to approximately 163 in any one camp.

"I have also determined that the total number of enrollees for the Civilian Conservation Corps should be gradually reduced to about 350,000 and this number be maintained through March 31, 1937."

The President also stated that additional funds "not to exceed $6,825,000 will be allotted as and when needed from the appropriation contained in the Emergency Relief Appropriation Act of 1935, for the balance of the fiscal year, and steps will be taken to secure the necessary funds for the fiscal year of 1937."

Preston Chief Forester Soil Conservation Service

The Soil Conservation Service announces the appointment of John F. Preston as Chief Forester in charge of the Section of Woodland Management. During the past ten years he has been Forester for the Hammermill Paper Company of Erie, Pennsylvania, with responsibility for all the company's woodland operations and land purchases. Previously he occupied various positions with the United States Forest Service and was for several years in the Branch of Forest Management in the Washington office.

Lumbermen to Meet in Chicago

The National Lumber Manufacturers Association has announced that its annual meeting will be held in Chicago, April 23, 24 and 25.

In view of the optimistic outlook for industry in general, and that of the forest industries in particular, the meeting is expected to be the most inspiring national gathering the lumber industry has had since 1929. All of the regional and species associations of lumber manufacturers qualified for membership in the national federation of such associations are now in active affiliation with it or about to join.

The program of the gathering will be intensively devoted to plans and projects for the aggressive extension of the activities of the associations and of their members. Accent will be on trade promotion.

$1.00
U. S. Govt. Lic. No. 8

A REMARKABLE PREVENTIVE, which, taken internally, by drops, "vaccinates" for an entire season. Used by the 9th Army Medical Corps in C. C. C. camps and by power companies for line crews. Immunization should begin at least two weeks before possible exposure.

▶ In mild cases POISONOK will materially shorten duration of rash. In severe cases see your physician for injection and adjunctive treatment.

POISONIVI

for Poison Ivy, also available at the same price and is just as effective.

At all drug stores on the Pacific Coast.. or order direct postpaid east of Rockies

Literature on request—

CUTTER LABORATORIES
4th and Parker Sts., Berkeley, Calif.
or Midland Bldg., West Adams Street, Chicago
Manufacturers of Vaccines and Antitoxins for the medical profession since 1897

Cool and Comfortable for Warm Weather Wear

Uniforms of the specified lighter weight 9 oz. Bronze Heather Green Tropical.

Also Regulation Garments for Rough Field Wear.

Write for Samples, Prices and Latest Descriptive Folder.

The Fechheimer Bros. Co.
UNIFORMS OF EVERY DESCRIPTION
CINCINNATI OHIO

For Forest and Brush Fires
INDIAN FIRE PUMP
USES ONLY *Clear* WATER
See D. B. Smith Ad Page 227

YUKON Pack Board

. . . for Easy Toting!

Forest service carries fire-fighting pumps weighing 70 pounds lashed to this board

GREATEST improvement in pack boards yet offered. Light weight spruce frame adjustable to give comfortable tension to cover. Wide web straps also adjustable. Cover, 12 oz. khaki U. S. Army Duck. Detachable bag is largest on any pack board—may be purchased with or without bag. Board alone weighs 3¾ lbs.; with bag 4¼ lbs. Absolutely guaranteed—money refunded if not satisfied.

Yukon Pack Board alone **$5.00**
Board with bag, complete **$8.00**
Prices Postpaid

SEATTLE TENT & AWNING CO.
Dexter Ave. and Republican
SEATTLE, WASHINGTON

Classified Ads

Fishing Tackle

FISHERMEN. Free new 1936 catalog showing many new and improved items for fly and leader makers; all that is new in tackle. Paul H. Young, 8065-13 Grand River Avenue, Detroit, Michigan.

Books

FLAGS OF AMERICA, by Colonel W. H. Waldron. Descriptive story of 48 Flags that have had a place in the making of "Old Glory," in original colors. A splendid reference book. Fifty cents per copy. Order today. The American Forestry Association, 1713 K St., N. W., Washington, D. C.

SAPLING SAM'S COLUMN

Sawn of A Gun!

I cranka da car,
Bawt she won't run,
Theese automobile
She's a sawn of a gun!
Shesa stop in da middle
Of da street upa town.
I look in da carburetor,
But shesa no drown.
I pusha da clutch,
Shaka da wheel,
Knocka da brake,
Da horn I feel,
I look in da tank,
Wot I see—yas!
Sawn of a gun!
Shesa outa da gas.

Hub.

Nuts Are Nuts

"Daddy, are flies flies because they fly?"
"I suppose so."
"Are fleas fleas because they flee?"
"Sure, what of it?"
"Well, I told teacher that bees are bees because they be."

Just a Joke

"Really, Bill, your argument with your wife last night was most amusing."
"Wasn't it though? And when she threw the ax at me I thought I'd split."—*Lumber Cooperator.*

Says the Fish

"Caution is a great asset in fishing, especially if you are a fish."—*The Forest Log.*

All Styles

Smokechaser Jerry Hickenlooper has accepted a position as haberdasher for the S. P. Railroad Company. He looks after the ties.—*The Forest Log.*

Woods Practice

There was a young lady named Ginter,
Who married a man in the winter;
The man's name was Wood,
And now—as they should
The Woods have a cute little splinter.
—*The Forest Log.*

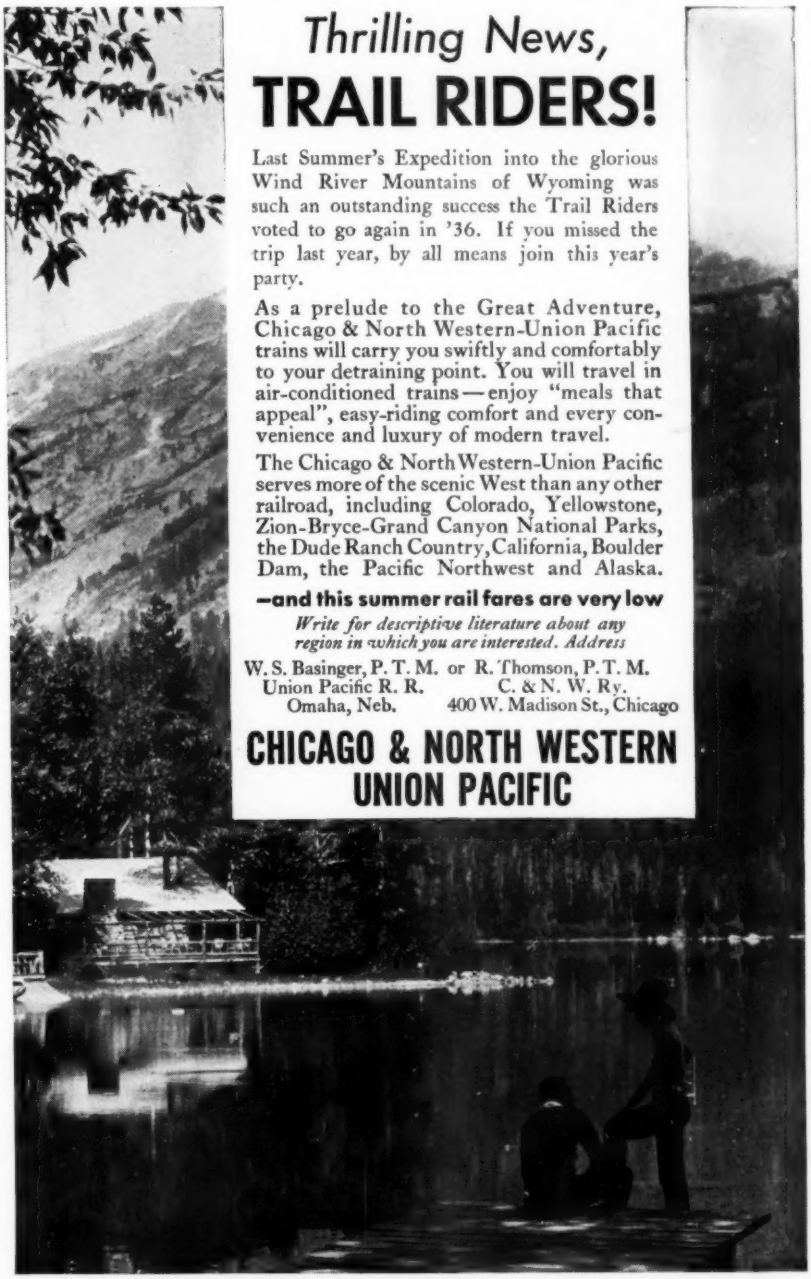
Which?

A negro hooked such a big fish one day that it pulled him overboard. As he crawled back into the boat he said philosophically: "What I wanna know is dis, is dis nigger fishing, or is dat fish niggering."

High-powered Ancestry

"I've got a pretty distasteful job before me," remarked the genealogist. "Mrs. Newrich employed me to look up her family-tree, and I've got to inform her that one of her relatives was electrocuted."

"Why worry about that?" said his friend. "Just write that the man in question 'occupied the chair of applied electricity at one of our public institutions'."



Thrilling News,

TRAIL RIDERS!

Last Summer's Expedition into the glorious Wind River Mountains of Wyoming was such an outstanding success the Trail Riders voted to go again in '36. If you missed the trip last year, by all means join this year's party.

As a prelude to the Great Adventure, Chicago & North Western-Union Pacific trains will carry you swiftly and comfortably to your detraining point. You will travel in air-conditioned trains—enjoy "meals that appeal", easy-riding comfort and every convenience and luxury of modern travel.

The Chicago & North Western-Union Pacific serves more of the scenic West than any other railroad, including Colorado, Yellowstone, Zion-Bryce-Grand Canyon National Parks, the Dude Ranch Country, California, Boulder Dam, the Pacific Northwest and Alaska.

—and this summer rail fares are very low

Write for descriptive literature about any region in which you are interested. Address

W. S. Basinger, P. T. M. Union Pacific R. R. Omaha, Neb.
or
R. Thomson, P. T. M. C. & N. W. Ry. 400 W. Madison St., Chicago

CHICAGO & NORTH WESTERN UNION PACIFIC

A Good Deal For A Dollar!

For a dollar you receive *Happy Days*—the authorized weekly newspaper of the CCC—for the next six months—including nine special issues, each covering the CCC activities during the past three years in one of the nine Army Corps Areas.

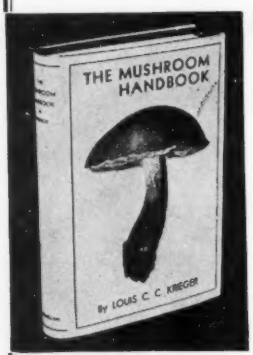
The first of the nine special issues—covering the CCC activities in the New England states—has already been published. The other eight special issues will appear during the next four months.

If you're interested in the conservation program now under way—if you want to keep in touch with the greatest of all peacetime movements—enter your subscription now to *Happy Days*. If you wish—we'll be glad to send sample copies without charge.

HAPPY DAYS

Daily News Building **Washington, D. C.**

The Most Complete



Handbook on the subject—

Illustrated in Full Color!

The Mushroom Handbook

By LOUIS C. C. KRIEGER

One of the outstanding authorities on the subject in the United States.

• Dependable and explicit is this handbook on mushrooms which describes and illustrates the many edible and poisonous varieties of mushrooms. An expert account of how to identify them, how to collect, grow, and pack them is offered in the 512 pages packed with information. There are 158 plates, 32 of them in full page color illustrations. Price $3.50.

At all bookstores or from

THE MACMILLAN COMPANY

60 Fifth Avenue New York City

A New Book about the BIBLE

A concise, accurate history of the Bible and Biblical events, of great interest and value for Bible students of all faiths—

THE BIBLE: Beacon Light of History

by Albert Field Gilmore, Litt. D.

This handsome, 300-page volume reprints the 54 articles which, when they recently appeared in The Christian Science Monitor, attracted 80,000 additional subscribers to that newspaper. Several additional chapters. Background, development, authorship and chief characters of the Bible. Development of the English Bible. Biblical criticism, late archeological discoveries. No doctrinal discussion. Bound in green cloth. $2.75. Postage 15c-20c*.

Other "Double A" Publications

THE ADVENTURES OF WADDLES, by the Hagers. $1.50. Postage 10c—15c*.
THE DIARY OF SNUBS, OUR DOG, by Paul Carmack. $1.50. Postage 10c—15c*.
MOMENTS MUSICAL, by Sonya Michell. $1.25. Postage 10c—15c*.
PARLIAMENTARY RULES SIMPLIFIED, by Arthur T. Lewis. $1. Postage 10c—15c*.
THE GLORIOUS ART OF HOME COOKING, by Hannah Dutaud. $2.75. Postage 15c—20c*.
ETIQUETTE IN DAILY LIVING, by Carilyn Stevens. $1.25. Postage 10c—15c*.
THE NEW SALESMANSHIP, by George H. Read. $1. Postage anywhere 10c.
AMERICA'S 12 WOMEN LEADERS of Past 100 Years, as selected in poll in Ladies' Home Journal, sponsored by National Council of Women. 75c. Postage 6c.
100 BEST BOOKS by American Women During Past 100 Years. $1.25. Postage 10c—15c*.

*Order now from local "Double A" agent, or bookstore, or direct. *West of Rocky Mountains and outside U. S. A. add larger postage indicated.*

ASSOCIATED AUTHORS

222 W. Adams, Dept. AF-5, Chicago, Ill.

Book Reviews

WHAT HAPPENS IN MY GARDEN, by Louise Beebe Wilder. Published by The Macmillan Company, 60 Fifth Avenue, New York City. Price $3.00. 257 pages, illustrated.

Almost equally divided between the rock garden and the ordinary garden, this book is written in a pleasant, conversational style. It presents the results of Miss Wilder's experiences in her own garden in a manner very helpful to the amateur gardener, as she gives brief, clear descriptions of the flowers and their reactions to soils and climates in such a way as to answer many of the reader's questions before they actually arise.—R. S. R.

TWIG KEY TO THE DECIDUOUS WOODY PLANTS OF EASTERN NORTH AMERICA, by William M. Harlow, Assistant Professor of Wood Technology, New York State College of Forestry, Syracuse University. Paper Covers 50c. Cloth Bound $1.00.

Those who enjoy the woods in winter and who would know the trees and shrubs by their buds rather than by their fruits or their leaves will welcome William M. Harlow's "Twig Key to the Deciduous Woody Plants of Eastern North America." To many students of botany as well as to the many casual observers of nature, this little handbook will open a new world of interest and beauty.

The key to which the title refers is the result of careful study, adjusted by years of experience with students, and the photographic illustrations of buds and leaf scars introduced a feature which is unique among all books on tree identification. It is an important addition to the growing literature on tree identification.—G. H. C.

THE MUSHROOM HANDBOOK, by Louis C. C. Krieger. Published by The Macmillan Company, 60 Fifth Avenue, New York City. 538 pages, illustrated. Price $3.50.

A complete handbook on mushrooms by an outstanding authority on the subject arrives to fill a real need—for people are interested in mushrooms. Whether this interest is that of the serious student and scientifically inspired, or whether it simply roots in the fact that mushrooms furnish a delicious and nutritious food, "The Mushroom Handbook" will be welcomed, for it treats the subject fully from all angles. Simple language and a clear, concise style cover the life history and habitat, general characteristics and seasonal occurrence of the higher fungi. The text itself is made more impressive by the full collection of accurate botanical drawings and photographic prints with which it is illustrated. For class-room use the book will be invaluable. There is an extensive bibliography which will be a boon to the student—and the group of recipes for the preparation of luscious mushroom dishes will delight the gourmet.—L. M. C.

LITTLE WATERS—A Study of Headwater Streams and Other Little Waters, Their Use and Relations to the Land. By H. S. Person, with Johnston Coil and Robert T. Beall. 82 pages, 60 half-tones, figures and maps. Government Printing Office, 1936. Boards. Price 35 cents.

This interesting and attractive book was written for the Soil Conservation Service, Resettlement, and Rural Electrification Administrations. It tells the popular story of the intimate relationships between the headwaters of streams and land and all that depend on land—forests and other vegetation, wildlife, fish, and mankind.

Printed on good paper, with large type, it is easily read. The contents are: Foreword; Land and Man, and three parts,—I—Patient Nature; II—Impetuous Man; III—Man and Nature; and a Postscript—Man and Land.

The Foreword is clear-cut, full of facts. Part I is particularly informative, helpful, and clearly stated; Part II is equally as good. Part III, while longer and more discursive, has a tendency toward longer sentences and scientific wordage; some readers might criticize this part as a bit argumentative and perhaps as propaganda. The story of the Coon Valley (Wisconsin) experiment in soil saving and land-use coordination is particularly clear and effective. The Postscript—Man and Land—sums up the entire relationship between water, land, forests, wildlife and man. The whole book ties in so closely with present-day problems of land-use and humanity that every conservationist should read it. It is also a splendid example of how to prepare the results of government studies and research to be of public use and interest.—J. D. G.

WILD FLOWERS OF LOUISIANA, by Caroline Dorman. Published by Doubleday, Doran & Company, New York City. 158 pages, illustrated. Price, $7.50.

This book contains some 350 brief descriptions of wild flowers native to Louisiana. It will prove of great help to the amateur in his identification of flowers and is especially valuable for its beautifully colored illustrations which are accurate in both form and color and make possible the recognition of a plant which words alone might fail to do.—R. S. R.

GARDEN FLOWERS IN COLOR, by G. A. Stevens. Published by The Macmillan Company, New York City. 320 pages. Price, $3.75.

This excellent book for the modern gardener briefly discusses and colorfully pictures every important flower and shrub now grown in American gardens. By facilitating the selection of the right plant for certain locations and soils it makes gardening more than ordinarily enjoyable.

The only adverse criticism would be of the relative proportions of the illustrations. Some small flowers are drawn on such an enlarged scale as to seem the same size as a much larger flower. This might tend to mislead the reader. However, the word descriptions often give the heights to which they grow and by suggesting their usage imply their size.—M. C. H.

ANNUALS IN THE GARDEN, by Stuart Ortiloff. Published by the Macmillan Company, New York City. Price $1.25. 75 pages.

This little book gives many practical suggestions to the home owner of how to get the best results from annuals, for cutting, for fragrance, for bedding, etc. It also includes a section on window boxes and hanging gardens as well as numerous diagrams for laying out gardens of different shapes and sizes.—R. S. R.

AMONG THE CURRENT PUBLICATIONS

Guide to Paths in the Blue Ridge, published by the Potomac Appalachian Trail Club, Washington, D. C., Price $3.00. Measured distances and detailed directions for 612 miles of the Appalachian Trail and 273 miles of side trails in southern Pennsylvania, Maryland, and Virginia. Illustrated.

Canoe Trips in Canada, published by the Department of the Interior, National Parks of Canada, Ottawa. This pamphlet charts the courses for numerous interesting canoe trips through Canada's waterways, giving the approximate time required as well as the distance covered by the trips. Illustrated.

Hemlock—The State Tree of Pennsylvania, by Henry E. Clepper, of the Pennsylvania Department of Forests and Waters, Harrisburg. This bulletin describes the growth and habitat of the hemlock, its botanical and physical characteristics, and products.

Woodland Carrying Capacities and Grazing Injury Studies, Bulletin No. 391, United States Department of Agriculture. Published by the Purdue Agricultural Experiment Station, Lafayette, Indiana, this bulletin is a progress report of actual grazing tests conducted cooperatively by the Purdue Station and the Central States Forest Experiment Station.

Migratory Bird Protection in North America, by John C. Phillips. Special publication, No. 4, of the American Committee for International Wildlife Protection, Cambridge, Massachusetts. The history of control by the United States Federal Government and a sketch of the treaty with Great Britain.

The Present Status of the Musk Ox. Special publication, No. 5, of the American Committee for International Wildlife Protection, Cambridge, Massachusetts. With notes on distribution, extirpation, transplantation, protection, habits, and life history.

New York State Parks. 81 illustrated pages. Obtainable from the State Council of Parks, State Office Building, Albany, New York. A brief description of New York State's system of state parks.

Flower Gardens for Colorado, by George A. Beach. Bulletin 408 of the Colorado Agricultural College, Colorado Experiment Station, Fort Collins, Colorado. Twenty-page bulletin on how to plant and care for a garden in Colorado, illustrated.

Colorado Weeds, by B. J. Thornton and L. W. Durrell. Bulletin 403 of the Colorado Agricultural College, Colorado Experiment Station, Fort Collins, Colorado. General information on weeds with directions for exterminating them in Colorado. Illustrated with line drawings for aid in identification.

The Protection of Jointed Wood Products Against Decay and Stain, by Ernest E. Hubert. Bulletin No. 4, Vol. XXIX, of the University of Idaho, Moscow, Idaho. 36 pages. Laboratory studies on jointed wood products such as window sash frames with emphasis on the importance of careful handling to prevent loss from decay and stain.

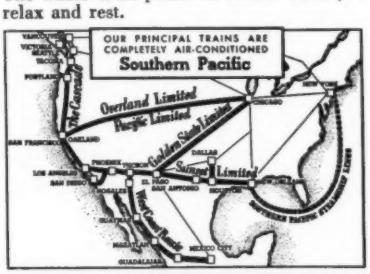
Sport Fishing in Canada, printed by J. O. Patenaude, King's Printer, Ottawa. Obtainable from National Parks of Canada, Department of the Interior, Ottawa. A brief forty-seven page resumé of the angling attractions of Canada.

Wilderness

Few trains get as far away from civilization as Southern Pacific's luxurious trains to California

THIS PHOTOGRAPH was taken high in the Cascade Mountains between Portland and San Francisco, on the observation platform of Southern Pacific's fast *Cascade*. There are no highways here, no towns—nothing but waves of evergreen mountains, patched with blue lakes.

Better than anything we can say, this picture describes the thrill of a Southern Pacific trip. The whole West passes in review while you relax and rest.

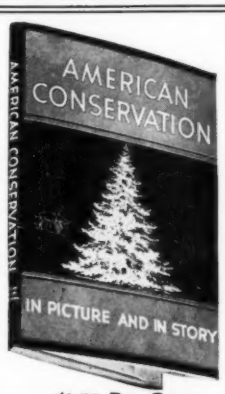


Nearly all of the western sights you'll want to see this summer are served by Southern Pacific, many of them exclusively by us. Yosemite, Carlsbad Caverns, Crater Lake, the Big Trees, Del Monte and the Monterey Peninsula, New Orleans, San Francisco, Los Angeles, Portland, San Diego, Lake Tahoe, Great Salt Lake, the High Sierra, and dozens more.

More comfort, less money

All principal Southern Pacific trains are *completely air-conditioned*. The Pullman surcharge is no more. Improved tourist sleeping cars give you many standard Pullman comforts at *half* the usual Pullman rates. Comfortable chair cars save even more. Our meal prices are very low.

So why not try a Southern Pacific trip to California this summer? Write our Passenger Traffic Manager, Mr. O. P. Bartlett, Dept. AF-5, 310 So. Michigan Blvd., Chicago, and he will gladly send you some interesting literature. Low summer roundtrip fares across the continent start May 15.



$2.50 Per Copy

AMERICAN CONSERVATION

60th Anniversary Number of AMERICAN FORESTS in Book Form, Revised and Cloth Bound

EDITED BY OVID BUTLER

This volume presents a clear picture of America's organic natural resources, the part they have played in the development of the nation, the manner and consequences of their use, and the spread of the conservation movement from its beginning in the United States down to the present time.

Send For A Copy

This story has delighted thousands of men and women. It belongs permanently in every home library because it is a story every American should know. Send for your copy.

THE AMERICAN FORESTRY ASSOCIATION
1713 K Street, Northwest Washington, D. C.

HESTER FIRE LINE PLOWS

Approved and recommended by Federal Foresters

• • • **for CONSTRUCTION**
Unequalled in efficiency and economy by any other equipment in use today for fire line construction. There's a model to meet every requirement of woods and topography.

• • • **for MAINTENANCE**
A specially designed plow for reworking old fire lines and renewing their effectiveness at much lower cost than producing new lines.

NOTE: All Hester Plows are designed to follow crawler type tractors, producing a continuous flat bottomed fire line in a one-trip operation and can be transported on their own wheels (without plowing). Write for literature and dealer's name.

HESTER PLOW CO., INC.
JACKSONVILLE, FLORIDA, U.S.A.

Sea Trout Blues 6-25 to 11-25 — Channel Bass 15-70 lbs. 6-1 to 10-15 — Sportsmen Families Home Comforts

FISHING
Hotel Washapreague

PRIZES FOR LARGEST AND MOST EACH VARIETY
Route 13, via Del-Mar-Va, auto or Express. Turn east at Keller Sta.

For details send for booklets.

Rods—Reels, Fishing Suits, Sale or Hire. If its fishing ask Mr. Mears, "He Knows," fishes 5 to 6 days week 7 mo. season.

A.A.A. & Keystone Club A.H.A. & Southern
A. H. G. MEARS (Ownership Management), Washapreague, O. Sts., E. S. Va.

CAMPING COMFORT

Famous line of Kapok and wool-filled Sleeping Bags. Light. Waterproofed. Adjustable to all temperatures. Canopy tops. Sheets or blanket lining. Ideal for any trip. Many styles from $7.85 to $45.00. Write for FREE illustrated descriptive folder. The American Pad & Textile Co., Dept. IK-5, Greenfield, Ohio.

Tapatco SLEEPING BAGS

Please Mention
AMERICAN FORESTS
WHEN WRITING ADVERTISERS

Conservation Calendar in Congress

Published monthly while Congress is in session as a service to the members of The American Forestry Association. This calendar contains important bills introduced in the Second Session of the Seventy-fourth Congress between March 11 and April 10, 1936. All bills introduced in the First Session of the present Congress retain their places on the calendar and may be considered during the session now convened. Whenever acted upon, previously listed bills will be described in this column, otherwise they may be considered as in the same status as when last printed.

APPROPRIATIONS

H. R. 11418—CANNON—Agriculture Department Appropriation bill. Passed Senate with amendments, March 24, 1936, in which the House refused to concur and thereupon appointed conferees on March 30, 1936. The Senate insisted on its amendments, agreed to the conference asked by the House on the disagreeing votes of the two houses, and appointed conferees on April 6, 1936.

H. R. 10630—TAYLOR—Interior Department Appropriation bill. Passed Senate with amendments in which the House refused to concur. House and Senate conferees appointed March 3 and March 5, respectively.

PUBLIC DOMAIN

H. R. 10094—TAYLOR—To amend Section 1 of the Taylor Grazing Act of June 28, 1934, by increasing the aggregate area of vacant, unappropriated and unreserved Public Domain on which grazing districts may be established from 80,000,000 acres to 143,000,000 acres. Passed the House on March 16, 1936. Referred to Senate Public Lands and Surveys Committee on March 16, 1936.

NATIONAL FORESTS

H. R. 9483—PIERCE—To extend the provisions of the Forest Exchange Act, as amended, to certain lands, so that they may become part of the Umatilla and Whitman National Forests. Introduced January 3, 1936. Reported from Committee on Public Lands without amendment (Report No. 2235) March 25, 1936 and referred to the Committee of the Whole House.

H. R. 11799—DEROUEN (S. 4284—WAGNER)—To repeal the proviso of the Act of May 18, 1928, Chapter 626 (45 Stat. 626) making additions to the Absaroka and Gallatin National Forests and improving and extending the winter feed facilities of the elk, antelope, and other game animals of Yellowstone National Park and adjacent land, and for other purposes. Introduced on March 13, 1936. Reported from the Committee on Public Lands without amendment (Report No. 2295) and referred to the Committee of the Whole House.

NATIONAL PARKS

H. R. 5722—MONTAGUE—Providing for the addition or additions of certain lands to the Colonial National Monument in the State of Virginia. Passed House on March 16, 1936.

H. R. 9183—MCCLELLAN—To provide for the extension of the boundaries of the Hot Springs National Park in Arkansas. Reported from Public Lands Committee on March 24, 1936. Report No. 2223. Considered on the floor of the House and passed, April 6, 1936.

H. R. 8431—DEEN—Establishing a National Monument to be known as the Fort Frederica National Monument at St. Simon Island, Georgia. Passed House on March 16, 1936.

FLOOD CONTROL

S. 4315—COPELAND—To provide for the controlling of floods on the rivers of the United States. Introduced on March 16, 1936 and referred to the Committee on Commerce.

S. 4343—COPELAND—To provide for the allocation of funds for flood control projects and emergency measures for protection against floods. Introduced March 24, 1936 and referred to the Committee on Commerce.

S. 3531—OVERTON—To amend the Act entitled "An Act For the Control of Floods on the Mississippi River and Its Tributaries, and for other purposes," approved May 15, 1928. Introduced January 9, 1936 and referred to the Committee on Commerce. Reported in the Senate on March 5, 1936. Report No. 1662.

MISCELLANEOUS

H. R. 10104—ROBINSON—To aid in providing the people of the United States with adequate facilities for park, parkway, and recreational area purposes, and to provide for the transfer of certain lands chiefly valuable for such purposes to states and political subdivisions thereof. Passed House on January 20. Reported with amendments by the Senate Committee on Public Lands and Surveys, March 16, 1936. Passed over in the Senate on March 27, 1936.

S. 2665—LEWIS—To change the name of the Department of the Interior and to coordinate certain governmental functions. On April 4 Mr. Lewis submitted an amendment, in the nature of a substitute, intended to be proposed by him to the bill.

H. R. 10106—STUBBS—To designate the (Sequoia gigantea) as the National Tree of the United States. Introduced January 10, 1936. Reported from Committee on Public Lands without amendment (Report No. 2213). Referred to House Calendar on March 19, 1936.

S. 3958 and S. 3959—LONERGAN—To prevent the pollution of the navigable waters of the United States and to amend Section 13 of the Act of March 3, 1899 relating to the deposit of refuse in the navigable waters of the United States, and Section 3 of the Oil Pollution Act of 1924. Introduced February 7, 1936, and referred to the Committee on Commerce which held public hearings on the two bills in March.

H. R. 12102 and H. R. 12103—HOLLISTER—To provide for the preparation of a plan to reduce the pollution of navigable waters and for the appropriation of money for that purpose. Introduced March 31, 1936 and referred to the Committee on Rivers and Harbors.

S. 4277—MCGILL—To amend Section 4 (relating to wind-erosion control) of the Soil Conservation Act passed February 29, 1936. Introduced March 16 and referred to the Committee on Agriculture and Forestry.

Forestry Questions Submitted to The American Forestry Association, 1713 K St., N. W., Washington, D. C., will be Answered in this Column. . . . . A Self-Addressed Stamped Envelope Accompanying Your Letter will Assure a Reply.

✣ ✣ ✣

QUESTION: Is there a successful spark arrester for locomotives burning hard coal?—S. M.—Pennsylvania.

ANSWER: The Delaware and Hudson Railroad Corporation is reported as having no difficulty with combustion or loss of hot sparks, while using so called "Draftac" netting with openings 3/16 of an inch by ¾ of an inch.

A centrifugal arrester known as the "Cyclone," requiring no netting has been used by the Northern Pacific Railroad and is being observed by the Forest Service.

QUESTION: Why are so many Pennsylvania farm houses surrounded by sturdy Norway spruce trees fifty to seventy-five feet tall, and twelve to 15 inches in diameter?—R. C. C.—Maryland.

ANSWER: These splendid specimens, according to the Pennsylvania Department of Forests and Waters, were probably seedlings secured by thrifty Pennsylvania farmers at the Centennial Exposition held in Philadelphia in 1876, and were all planted at approximately the same time.

QUESTION: Would it do any harm to ordinary deciduous trees to put a couple of inches of new sawdust for a distance of several feet around the young tree, so as to prevent any vegetation from sharing the food and the soil with the roots of the tree, and also acting as a kind of reservoir for moisture?—T. W. P. —Pennsylvania.

ANSWER: Most deciduous trees grow naturally in an acid soil. Accordingly, it is believed the sawdust mulch would keep down weed growth, maintain loose soil texture, conserve soil moisture for the use of the small trees, and in general do no harm.

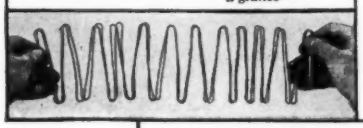
QUESTION: Please give information regarding Myrtle trees, their wood and its use.—E. O. H.—Oregon.

ANSWER: The commercial range of Oregon Myrtle (*Umbellularia californica*) is chiefly in the region about Coos Bay and the river valleys of southwestern Oregon. The botanical range extends along the coast range in California and on the western slopes of the Sierras to the San Bernardino Mountains. It seldom attains large tree size outside its commercial range. In California it is commonly known as California laurel. The stands of accessible timber have been so heavily cut that suitable material for commercial uses is inaccessible.

The close grained, golden brown wood is heavy, hard, strong, and takes a beautiful polish. It is made into novelties, turnings, interior trim, furniture, boat trim, and musical instruments.

The Unseen Advantages Are Even More Important!

You see the advantages of the Atlas Accordion Fold at a glance—



ATLAS

ACCORDION FOLD
ELECTRIC BLASTING
CAPS

But Inside—The accurate Atlas Match Head firing device is the heart of effective electric blasting. Its assembly is insulated from the copper shell by a fibre tube and held adjacent to an all pressed detonating charge—all protected by special waterproofing plugs—giving a watch-like precision in action.

Still Further Inside—Within the Match Head, the bridge wire is stretched across two metal terminals and actually imbedded in a special firing composition to insure positive, instant action. It is the last word of refinement in precision firing.

No wonder the genuine Atlas Accordion Fold Electric Blasting Cap is accepted as standard for up-to-date firing practise

ATLAS POWDER COMPANY, WILMINGTON, DEL.

Cable Address—Atpowco

Everything for Blasting

OFFICES

Allentown, Pa.	Joplin, Mo.	New Orleans, La.	Pittsburgh, Pa.	Spokane, Wash.
Boston, Mass.	Kansas City, Mo.	New York, N. Y.	Portland, Oregon	St. Louis, Mo.
Butte, Mont.	Knoxville, Tenn.	Philadelphia, Pa.	Salt Lake City, Utah	Tamaqua, Pa.
Denver, Colo.	Los Angeles, Calif.	Picher, Okla.	San Francisco, Calif.	Wilkes-Barre, Pa.
Houghton, Mich.	Memphis, Tenn.	Pittsburg, Kansas	Seattle, Wash.	

ATLAS
EXPLOSIVES

CHEMICALS ATLAS EXPLOSIVES

PROFESSIONAL FORESTRY SCHOOLS REPORT

By H. H. CHAPMAN

Harriman Professor of Forest Management, Yale University

An official report on 21 undergraduate and 3 post-graduate institutions offering curricula in professional forestry in the U. S. 188 pages, 17 tables, 21 diagrams. Price $1.50.

Contains the results of an exhaustive two-year study of all professional schools of forestry in the United States, conducted by the Society of American Foresters. Analytical tables and grades are given for each school under the headings departmental status, faculty and teaching load, personnel of teaching force, financial support of the department, equipment, field instruction, history of school, and standing of alumni.

The report also contains a complete comparative analysis of the curricula offered by each school in technical forestry, and in specialized subjects such as lumbering and logging engineering, wood utilization and technology, range management, wildlife management, forest entomology and pathology, landscape and recreational engineering, and municipal forestry.

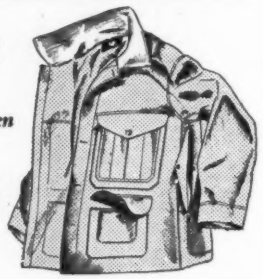
Send your order today to

THE AMERICAN FORESTRY ASSOCIATION

1713 K Street, Northwest, Washington, D. C.

. . Flexible, Light-Weight Comfort *plus* Weather Protection

Ideal for Fishermen



$4.75

A new BUTTNICK COAT

FISHERMEN—here is your coat! Not heavy, not bulky, but light, flexible, comfortable. Double shoulders and back give you protection against rain. Plenty of large, roomy pockets—entire back a pocket, all with snap flaps. Ideal for spring and summer wear. Finest quality U. S. Army Duck, dry-waterproofed. All seams double-sewed, style and tailoring are the finest. At this price, every fisherman should have one of these coats.

ONLY $4.75 Postpaid anywhere in the United States

If not completely satisfied, return in five days, money refunded.

BUTTNICK MFG. CO.
204 FIRST AVENUE SOUTH · SEATTLE, WASH.

RIDE

THE REDSKIN'S RIGHT-OF-WAY!

Glide through glorious wilderness with an Old Town Canoe and a pack! . . . The effortless stroke of a paddle takes you from camp to camp. You can fish and hunt in the gamiest haunts. Live the real life of an Indian!

An Old Town Canoe is the birchbark's twin. Only it's tougher and steadier! Leakproof and light. Inexpensive to own. There's no costly up-keep, and prices begin at $68. Write for a free catalog showing paddling, sailing, sponson, and square-stern types. Also sturdy outboard boats, including large seaworthy models for the family camp. Dinghies. Rowboats. Address: Old Town Canoe Company, 255 Main St., Old Town, Maine.

"Old Town Canoes"

A FOREST SAVED IS A FOREST RAISED

RESOURCES COMMITTEE REPORTS ON IRRIGATION AND DRAINAGE

The first national inventory of land which might be reclaimed for agriculture by irrigation or drainage has been completed for the National Resources Committee by the Bureau of Agricultural Engineering.

Final figures of the inventory, which are contained in a report published by the National Resources Committee on March 27, estimate that there remain in the United States approximately 100,000,000 acres which could be adapted to agricultural pursuits by drainage and more than 30,000,000 acres which could be reclaimed by irrigation. This report, which has not been acted on by the National Resources Committee, is Part IV of the Supplementary Land Report which will appear in eleven parts when complete.

This total of approximately 130,000,000 potentially arable acres is approximately 27,000,000 greater than the aggregate agricultural area now improved by irrigation or drainage in the United States, according to the report. The most recent figures show about 19,000,000 acres in the present irrigated areas and about 84,000,000 acres in enterprises organized to effect drainage. Of the 84,000,000 acres in organized drainage enterprises, 65,500,000 acres are improved lands.

Parts of the supplementary reports to appear later will present results of studies of submarginal land which should be withdrawn from cultivation because it lacks economic production value. Other parts of the report deal with the complete problem of land requirements, exports, maladjustments of land use, forest problems, wildlife and Indian lands.

Based on the study of drainage areas, the report finds that "there are over 20,000,000 acres of unimproved lands in organized drainage enterprises. These lands are producing practically no income. They hamper the progress of the drainage districts because they cannot support their proportionate share of maintenance expenses. Districts which are agriculturally sound should be completed. In some cases it will probably be necessary to abandon uneconomical enterprises which contain large areas of unimproved lands.

"The possibility of utilizing swamp and wet lands as bird and game refuges or public shooting grounds, for raising fur-bearing animals, or for recreational purposes, and taking them out of agricultural use, should be given careful consideration. Where such tracts owned by the public are available to all residents, recreational areas seem highly desirable.

"A study should be made of drainage legislation with a view of improving the organization and legislative procedure so that drainage overhead expenses will be decreased and more adequate drainage can be secured by the farmer."

Commenting on irrigation conditions in seventeen western states the report says:

"Crop agriculture of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming is usually considered in terms of irrigation, although there are scattered areas of grain and forage crops, large in total, that are watered by natural precipitation alone. The coast states of California, Oregon, and Washington have zones west of the Coast and Cascade Mountains where irrigation is merely supplementary to natural precipitation, although even there the increases in yields which may be brought about by irrigation are awakening a wider interest in irrigation supplies for use in the drier months of the year.

"East of the Coast Range in California and east of the Cascades in Oregon and Washington irrigation is thought of in the same terms as in the Mountain States listed as wholly dependent upon irrigation. The eastern tier of states—North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas—includes a midway zone where irrigation might be used to advantage in excessively dry years, such as 1934, and where in most years the yields of truck crops would be improved by supplementary irrigation; but in the eastern portions of those states the rainfall, as a rule, is such as to permit farming to be conducted without irrigation.

"Of the area under present irrigation" the report says "a very large portion was supplied with water at costs of less than $50 an acre and very little of it exceeded $100 an acre. However, it is noticeable that but little of the future development is possible at a charge of less than $50 an acre for water. It is quite likely that, for many projects, the costs indicated in zones in excess of $50 an acre will always be more than the lands can economically support. This means that some form of subsidy will be necessary to make many of the projects of the future acceptable from an economic standpoint."

THE OUTLOOK FOR THE WILD FLOWERS

(*Continued from page* 217)

source of supplies should be ascertained. Too often dealers with no stocks of their own, fill orders for "a hundred trilliums" or "fifty mertensias" by ravaging the nearest woods, carrying away its treasures by the truck-load. It was a dealer of this kind who offered arbutus at $1 a hundred, pitcher plants at $3 a hundred and Jack-in-the-pulpit at $1.50 a hundred. Fortunately there are nursery men, and their numbers are increasing, who are propagating wild flowers from seed and root division, so that they can be secured without the feeling that some spot of earth is less beautiful for their purchase. The Garden Club of America, through its conservation committee, has compiled a list of the firms in each state which propagate seeds and native plants on their own grounds. They will find a ready market among those who regard the ethics of acquiring wild flowers.

It is true that the seeds of some of our choicest native flowers are slow to germinate, apparently unwilling to increase except by nature's planting. As a botanist has written: "The reason why a plant is 'rare' is not so much its popularity as its weakness. It has some weak link in its life history, such as poor seed-germination or limited adaptability with regard to soil, light, or water. To find this weak link and help millions of seedlings over it, is a step forward in conservation."

Not for careless hands is the propagation from seeds fine as dust of wild flowers like the showy ladyslipper (*Cypripedium spectabile*). Only under certain conditions can they reproduce themselves, which makes our

NURSERIES

Trees for Forest Planting

PINE • SPRUCE

Firs, Arborvitaes and Other Conifers. We raise all our trees in our own nurseries.

KEENE FORESTRY ASSOCIATES
KEENE, NEW HAMPSHIRE

EVERGREENS, Deciduous Trees and Flowering Shrubs
(Quality considered) in Large Quantities can be purchased from us More Reasonably than anywhere else. Write for list and prices.
KELSEY NURSERY SERVICE
(Established 1878)
50 Church Street New York City

EVERGREEN TREES
FOR FOREST PLANTING
CERTIFIED White Pine, free from blister rust. Norway and White Spruce, Scotch and Red Pine and other varieties. Know our reasonable prices. Get our figures on Contract Planting.
WESTERN MAINE FOREST NURSERY
Dept. A-56, Fryeburg, Maine

CHINESE ELMS
50 Trees, 3 to 4 feet.....$5.75
50 Trees, 2 to 3 feet..... 3.25
4 Phlox, 4 Delphiniums, 4 Columbine, all blooming size and assorted colors, $1.50. Order direct from this ad. Catalog of general line of Nursery Stock free.
SWEDBERGS NURSERY
Battle Lake, Minnesota

University of Maine
Orono, Maine
The Forestry Department offers a four-year undergraduate curriculum, leading to the degree of Bachelor of Science in Forestry.
Opportunities for full technical training and for specializing in forestry problems of the Northeast. Eight-weeks' camp course required of all Seniors in Forestry, in practical logging operations, on Indian Township, Washington County, Maine, under faculty supervision.
For catalog and further information address
FORESTRY DEPARTMENT,
University of Maine
ORONO, MAINE

USE THE
INDIAN
FIRE PUMP
For Forest, Grass, Brush Fires
See D. B. Smith Ad Page 227

mourning all the greater when they are ruthlessly destroyed. Yet much valuable research is being devoted to finding the secrets of plant-life and learning methods of propagation that will help immeasurably in preserving the wild flowers. Coville has found the secret of growing the lovely but difficult trailing arbutus; Aiken of Vermont and others, after long experimentation, triumphantly offer fringed gentians raised from seed. The Boyce Thompson Institute's experiments in the propagation of holly and other plants in danger of diminishing numbers, the work of Purdy and other florists in California and the Northwest give hope that the procession of vanishing native flowers and plants may be halted.

Out of all this research not only may our rare and choice wild flowers be saved for the enjoyment of future generations, but other forms may by scientific hybridizing be developed and improved as some of the flowers in our domestic gardens have been. After all, they too were "wild" to begin with. The small-flowered, weak-stemmed gladiolus of southern Africa seems like a poor relation compared to the splendid spires of bloom shown today; the gorgeous Talisman and the Dawn have come a long distance from the single wild rose.

Our mullein, the "flannel-leaf" of childhood days (*Verbascum thapsus*), in the skillful hands of English hybridizers, has become the stately large-flowering plant like V. Miss Willmot. It has, as Mark Twain said of the cauliflower, "had a college education." The coarse, gaudy flower that the German botanist, Dr. Zinn, brought from Mexico, long ago, has developed into our velvet petalled dahlia-flowered Zinnia. There's no end to the fascinating histories of transformation which our gardens could tell.

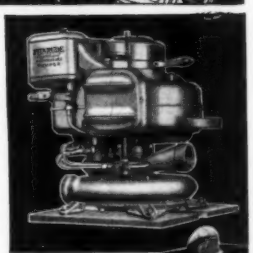
Many of our wild flowers just as they are, now that their beauty and adaptability are recognized, are finding a place in the catalogues. It would seem like profanation to try to change the wild "sweet William" (*Phlox divaricata*) with its shimmering petals of violet-blue; or the blue bells of the mertensia; the butterfly weed (*Asclepias tuberosa*) the boltonia with its loose sprays of snowy blossoms—these and a host of others need only to be known to be appreciated. Professor Herbert Durand, author of "Wild Flowers and Ferns," some years ago expressed the opinion that our wild flowers would be best protected by bringing them into cultivation. But as we see them in their adopted homes our satisfaction over their "domestic" safety is shortened by memories of their wild beauty in native haunts, deep in the woods or on the virgin prairie. These thoughts make us hail with anticipation the return of land that never should have been tilled, back to forest use as additions to our National Forests and Parks; the study of land values; a less grudging attitude toward land not producing grain. For forests mean not only conservation of wood, soil, water and of wildlife but also conservation of wild flowers and blooming shrubs. Those who have visited parks or forests know the joy of seeing wildlife, both plant and animal, timidly come back. Flowers begin to appear in colonies instead of scattered specimens because they are at home.

All these constructive plans for preserving or propagating our native plants, whether from pure love of them or from motives of self-interest, tend towards the same much-desired result. With the education of the children in our schools in the importance and meaning of true conservation, they give confident hope that the time will never come when our country will lack that last touch of grace given by the wild flowers.

EVINRUDE SPORTSMAN $55

AMERICA'S MOST POPULAR OUTBOARD
1936 model an even greater value than before. The Sportsman attaches instantly to any boat; drives rowboats, canoes, skiffs, fishing boats up to 7 m.p.h. Runs 3 hours on gallon of fuel. So simple to operate that a child can easily start and run it. Note the handy light weight—only 24½ lbs. Extremely quiet — underwater silenced. Write today for new catalog describing Sportsman and 7 other Evinrude models, including the new Hooded Power SPORTWIN, only $77.
Address EVINRUDE, 4780 N. 27th Street Milwaukee, Wis.

SEND FOR FREE CATALOG



High capacity with high pressure . . . up to 150 gallons per minute, up to 150 pounds Pressure.

FIRE FIGHTING

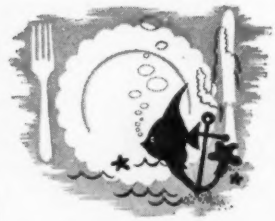
ONLY 65 LBS. **$295.**

Write today for complete performance tables and specifications on this newest-type, smooth-running four-cylinder EVINRUDE Fire Fighter. Develops 9.2 H. P. at 4000 R.P.M. Sand and other foreign substances handled without wear by simple, non-friction centrifugal pump of exclusive Evinrude design. Write EVINRUDE Division, Outboard Motors Corp., 4793 N. 27th St., Milwaukee, Wis.

EVINRUDE CENTRIFUGAL HIGH PRESSURE PUMPER

NATURAL BRIDGE
ONE OF THE SEVEN NATURAL WORLD WONDERS

HOTEL
Rooms $1.50 and up.
COTTAGES
Double Rooms $1.00 per Person
NATURAL BRIDGE, VIRGINIA.



MIX YOUR SPRING TONIC WITH VITAMIN **SEA!**

WINTER'S apt to leave you winded. A tonic helps, but what you really need is a breather by the sea, plus heartening food and complete relaxation at these beach-front hotels. Restful seaside lounges. Health baths. Ocean Decks. Spring sports. It's surprising how little it all costs at these versatile hotels. Come down soon!

Leeds and Lippincott Company

Chalfonte-Haddon Hall

ATLANTIC CITY

"The Strongest Geared Power for Its Weight in the World"

COMPACT
POWERFUL
SAFE

THREE SIZES

Two Ton "Lightweight"
Five Ton "General Utility"
15 Ton "Special"

Positive internal brake—Two quickly shifted speeds —Adjustable length crank handle—Anti-friction babbitt bearings — Spring operated safety dog.

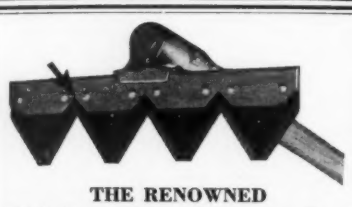
Dealers in all principal cities.

Full descriptive literature gladly mailed.

BEEBE BROS.

Incorporated

2724 6th Ave. S. Seattle, Wash.



THE RENOWNED

Rich Forest Fire Fighting Tool

Write for Prices and Description

C. H. RICH WOOLRICH, PA.

SAVING THE SUGAR ORCHARD

(*Continued from page* 221)

In the Smith sugar orchard of 1,200 young maples, where a planned effort is being made to conserve this unique industry. It is on the slopes of Mt. Ossipee, in Waterboro, and is known as the conservation orchard.

as expeditiously as possible, and while thoroughly business-like and probably profitable as the modern methods may be, one cannot but regret their lack of the romantic features that made the old-fashioned sugaring operations so alluring. Pipes instead of ox-hauled sleds and barrels, metal spouts instead of sumach spiles, and galvanized pails replacing wooden keelers may have made the maple sugar industry more lucrative, but they have just as surely robbed it of its quaintness and charm.

It will be generations before the maples of the Smith orchard attain the girth of many trees now being tapped. For instance, just over the Lovell River, which divides Maine from New Hampshire, there is an ancient sap orchard. One of the trees wears a necklace of eight huge buckets strung about its trunk in sapping time. They are real giants and make the young trees on Mt. Ossipee look like saplings.

What a difference there is in the atmosphere of one of these ancient orchards and one composed of maples standing in a newly lumbered woodland! For just as an old house is redolent of sweet memories, mellowed by "a heap o' livin'", and a new house, however trim, is entirely lacking in the charm acquired by use, so the aged maple grove is filled with subdued light and sound, the tranquillity of ripe years, and the young orchard, standing slim and eager, seems imbued with an air of haste and efficiency.

When all is said and done, efficiency is the word today, and what if romance and beauty be sacrificed to the end that maple syrup may be made more efficiently than by the old methods? Without conservation, another modern idea, there would be no more maple syrup within a few years.

Future generations, never having known the enchantment of the ancient sap orchard, will not miss it, and we, who have experienced it and find it lacking in the young orchards, will have to search out the old-fashioned sugar bush of the New Hampshire hills to get the proper atmosphere.

THE JEWELED FORESTS OF ARIZONA

(*Continued from page* 210)

with the Black Forest, make up Arizona's total area of petrification.

In direct contrast to the highly colored strata in the first four forests, the Black, or Fifth Forest, presents a richer, more sombre shade. It is like a vault of dark jewels, dark woods that appear as carbonized palms still bearing the delicate hairline tracery of exquisite fernery.

A medley of vivid tints and pastel shades mingle and intermingle in the First, Second, Rainbow and Blue Forests. From a distance the desert floor itself appears as an endless field of old rose shadings. On closer inspection this mysterious rose is found to be fossilized coral! Coral! Habitat of oceans! Like tiny pink rosebuds, the fragile coral forms cover what once was the salted bottom of an ocean, now a vast area of alkaline waste, its buried treasures tinted to match rainbows and roses!

Quantities of iron oxide left in the bitterly dried ocean bed, together with iron pyrites, siderite and dolomite, all of which are petrifying chemicals, might have combined forces to fossilize the vast beds of coral left high and dry by long departed ocean waters.

Every combination of shade imaginable runs the entire chromatic gamut on the Arizona desert. The multitudinous colors of its enduring stone jewels are uncountable and unnumbered. The colors, instead of having faded through their long exposure to sun and wind and rain for millions of years, remain fast and unfading. After rain has fallen, they are even more vivid, more beautiful. They are truly the jeweled forests of Arizona!

THE CONTROL OF STREAM POLLUTION

(*Continued from page* 207)

trol as the running water of an interstate river with its attendant load of pollution. It is entirely possible for local or state agencies to stop a train, an airplane, a criminal, or diseased animals or plants from crossing its border, but no man or group of men can stop a river from obeying the laws of gravity; and when these laws decree that it shall flow through several states, the Federal Government alone is the logical agency to have jurisdiction.

The expense incident to the construction of suitable treatment plants has been a major obstacle to both municipalities and industry, although in many cases it has been more of a convenient alibi than an actual obstacle. The idea, however, that such treatment would impose a heavy additional burden on the public, is entirely erroneous. The public is paying the bill now with interest, only in other ways, and without getting anything for its money except bacteriologically safe water from the faucet. There would be a different distribution of costs, but no increase, for in the final analysis it would not cost the public a thin dime to handle properly the pollution problem —and it would receive thousands of miles of clean streams as a clear dividend on its investment.

Only a part of the public is interested in pure streams for their own sake and their recreational values, but every single member of the human race is interested in water for internal consumption, for his very life and existence depends upon it. More than seventy per cent of the weight of the human body is water. Therefore every one should be interested in the quality of the water he is obliged to drink and in the added costs of this water to him as a result of polluted supplies. As an illustration, a careful analysis of the elaborate treatment costs of the water supply for the city of Pittsburgh reveals that it is costing the citizens $250,000 annually over and above the normal costs of supplying the same quantity of water at the faucet, if the source of supply were not polluted. The City Council in a resolution dated October 21, 1935, and directed to the Attorney General of the State, includes additional expenses incident to the use of this chemicalized water, such as increased soap consumption and corrosive losses to plumbing and fixtures, bringing the total annual "pollution penalty load" of the citizens up to $500,000. This is a continuing annual charge that is increasing yearly, and not one single penny of it is devoted to correction of the source of the trouble. At four per cent this annual penalty represents the interest on $12,500,000—and a capital investment of this amount would certainly go a long way toward correcting the source of the trouble, if not entirely curing it.

But these figures by no means represent all of the public expense resulting from pollution. While the final product delivered at the faucet may be bacteriologically safe for human consumption, it can by no stretch of the imagination be considered pure water. The bacteria and human wastes in a polluted water supply are only partially removed by treatment; they are killed and rendered largely innocuous by the introduction of tons of chemicals, but much of this disinfected waste is still consumed in the water as one can readily ascertain by examining a glass of water from Pittsburgh or Philadelphia that has been standing long enough for these wastes to settle. Just what effect this conglomerate mess of toxic chemicals and disinfected wastes may have on the human system when taken internally is at present imperfectly known, but it is certainly not beneficial—nor very appetizing when one considers that the water he is forced to drink was used shortly before by someone else!

Studies of the medical profession have determined that many stomach and intestinal disorders are directly traceable to polluted waters, and although they have not yet conclusively proven the connection, they strongly indicate a very definite one between the consumption of "treated sewage" and that dread and malignant disease, cancer. Some day we will likely learn that a considerable part of the expense incident to the maintenance of hospitals can be traced to the injurious effects of drinking large quantities of chemical disinfectants and disinfected wastes with our water. Cities with pure water supplies, other factors being equal, show a better health record, but very few of them, especially in the industrial East, escape the public pollution penalty; for in order to find a pure source, they are frequently obliged to bring their water from great distances, and then often buy practically the entire watershed to protect these supplies against pollution. When the public finally wakes up to the economic wastefulness and indecency of the whole rotten

WEBLEY AIR PISTOLS
The World's Finest Air Guns
Accurate, silent, powerful, smokeless. Looks and feels like an automatic. Made to celebrated Webley & Scott fine arms specifications.
SENIOR $22.50
JUNIOR $11
Illustrated and Priced in NEW CATALOG
W. & C. SCOTT Shotguns, Rifles & Revolvers
NEW CATALOG READY!
Send 50¢ in coin, check, M.O., or stamps for No. 26, the greatest of all Stoeger Catalogs. 304 pages, 12,000 items, 4,000 illustrations. LATEST REDUCED PRICES of all American & Imported Arms & Ammunition. Complete Gun Parts Section, Targets, Chamber Reamers, Gun Barrels, Restocking, Ballistics.
New 26
A. F. STOEGER GUNS
A. F. STOEGER, INC.
AMERICA'S GREAT GUN HOUSE
507 Fifth Ave. at 42nd St. New York, N.Y.

Grafted Hybrid Rhododendrons

Since 1878 these have been a specialty with this Company. The Hybrids are noted for the beauty, richness and large size of the flowers and the variety of color. They are more tolerant of poor growing conditions than are other Rhododendrons. They bloom from May (boule de Niege) to early June (Album elegans). The prices are lower than in twenty years.

SIZES	VARIETIES
ABCDEFG-M—	**Album elegans.** White. Late.
ABCDEF—	**America.** Deep red.
ABCDEFG-M—	**Amphion.** Pink, white eye.
ABC—	**Boule de Niege.** Early white dwarf.
ABCDE--	**Caractacus.** Deep crimson.
ABCDEFG-M—	**Catawbiense album.** White; native.
ABCDEFG-M—	**Catawbiense grandiflorum.** Rose.
AB—	**Charles Dickens.** Dark red. Spotted.
B—	**Delicatissima.** Pink-white. Late.
ABCDEFG—	**Dresselhuys.** Analine red.
ABCDEF—	**Dr. H. V. Rutgers.** Fiery red.
ABD—	**E. S. Rand.** Rich scarlet.
ABCDEFG-M—	**Everestianum.** Lilac-rose.
E—	**H. W. Sargent.** Red. Late.
ABCDEFG—	**Ignatius Sargent.** Good rose.
ABC—	**Kettiedrum.** Rich crimson.
ABCDEFG-M—	**Lee's Dark Purple.** Good purple.
AB—	**Maximum roseum.** June pink. Native.
ABCDEFG-M—	**Mrs. C. S. Sargent.** Best strong pink.
AB—	**Mrs. D. Den Ouden.** Crimson; compact.
ABDE—	**Old Port.** Rich plum color.
ABCD—	**Parson's Grandiflorum.** Rose purple.
ABCDEFG-M—	**Pres. Lincoln.** Lilac pink.
AB—	**Prof. F. Bettex.** Scarlet-dwarf.
D—	**Prof. Rauwenhof.** Good red.
ABCDEFG-M—	**Purpureum elegans.** Purple; late.
ABCDEFG-M—	**Roseum elegans.** Lavender; dwarf.
ABEF—	**Roseum superbum.** Bright rose.
AB—	**Van der Broeke.** Dark carmine.
AB—	**Van Weerden Poelman.** Crimson.

One-year Grafted Plant

SPECIAL PRICES

	(Each)
"A"—1-yr. grafts (8 in.) B. & B.	$1.00
"B"—2-yr. grafts (12 in.) B. & B.	1.60
"C"—12 to 15 in., budded	2.00
"D"—15 to 18 in., budded	2.50
"E"—18 to 24 in., budded	3.00
"F"—21 to 24 in., budded	3.50
"G"— 2 to 3 ft., specimens	4.00
"M"—Special 2 to 2½ feet grade. Not perfect form, for mass effects—$2.50.00 per 100	3.00

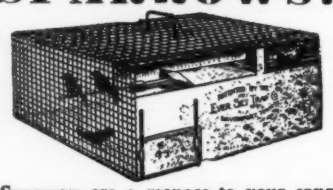
KELSEY'S SHORT GUIDE, 1936

Contains hundreds of other interesting shrubs, evergreens, and trees. Many illustrations in color. Mailed free if you mention AMERICAN FORESTS.

KELSEY NURSERY SERVICE

50 CHURCH STREET NEW YORK CITY

GOOD-BYE SPARROWS!



Sparrows are a menace to your song birds, garden and poultry. Why put up with them a single day longer?

Get rid of them the positive way with an EVER-SET SPARROW TRAP.

Never Fails to Work

THE EVER-SET TRAP is simple in construction; automatic in action. Nothing to wear out or get out-of-order. Rust proof and easily cleaned. Catches from 10 to 25 sparrows daily.

A few bread crumbs, chicken feed or grain is the only bait you need. And it never fails to work!

MONEY BACK GUARANTEE

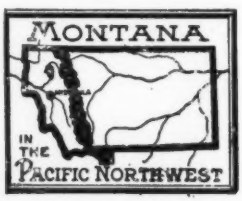
Ever-set is the perfect sparrow trap—simple, sure, effective. It is positively guaranteed to give complete satisfaction, or we will immediately refund every cent of your money upon return of trap in good condition.

Order Yours Now

Simply mail us your check or money order for only $4.25—and we'll send your EVER-SET TRAP prepaid. After you own one, you'll know why there are over 20,000 in use today.

EVER-SET TRAP CO.
3025½ Grand Ave. Davenport, Iowa

MISSOULA
The Garden City



In the heart of the Fishing, Hunting, Recreation and Scenic Empire of Western Montana.

Center of five fertile agricultural valleys.

700 miles of trout fishing waters within a radius of twenty-five miles of the city.

Dude ranches, U. S. Bison Range and primitive forests within a few miles of the city.

Location of State University, U. S. Forest Service, Fort Missoula and the largest sawmill in Montana.

Splendid opportunities for homes, farms and business locations, as well as for the recreational advantages.

For illustrated booklets and reliable information write Missoula Chamber of Commerce, Missoula, Montana

system, it will demand that the system be reversed so that parties responsible for pollution will correct it at the source instead of passing it on to the entire public to worry about.

The establishment of the Public Works Administration and other works agencies of the Federal Government gave new hope to the advocates of pure streams. Unfortunately the hopes were much higher than the realizations, for with the exception of the project of sealing abandoned coal mines, which was finally approved as a CWA project and which ran the gauntlet of succeeding alphabetical agencies with frequent stops which minimized the possible results, little was accomplished. This worthy project has just recently been revived, after more than a year of inactivity, during which time Washington was reputedly looking for worthwhile works. PWA offered a splendid opportunity for the installation of needed sewage treatment plants, but cities were reluctant to avail themselves of this opportunity with the result that only 133 allotments were made for sewage treatment plants to relieve pollution, while 420 new sewerage systems without any treatment plants were authorized, adding to the pollution load—further proof that human nature is altruistic in theory, perhaps, but not in practice. Although the net result of PWA has been to aggravate rather than relieve the pollution problem, it is noteworthy that the capital city of Washington has joined the honor roll of cities installing sewage treatment plants.

New impetus was given the pure streams cause in December, 1934, when the Dern-Lonergan Conference brought together in the office of the Secretary of War about forty conservationists and public officials from different states and turned the spotlight on the national aspects of the situation. The report of this conference urged direct Federal control of pollution on a watershed basis and the strengthening of the Federal authority by Congress.

Now comes the report of the Special Advisory Committee of the National Resources Board on water pollution, which in its factual findings agrees essentially with the Dern-Lonergan Committee, but in one important respect differs sharply. It seems strange indeed after finding that state laws lack necessary uniformity and are entirely inadequate, that interstate compacts have consistently failed, that mandatory powers are essential, that the problem must be handled on the basis of watersheds instead of state lines, and that Federal legislation on the subject is inadequate, that this committee should recommend there be no basic change in existing Federal laws, but rely on hoped-for changes in the laws of forty-eight different states so that they could control the problem individually and through compacts with the advice and assistance of the Federal Government! With the exception of this recommendation for delaying Federal control pending the findings from the proposed Potomac River pollution control unit, wherein the entire Potomac system is to be used as an outdoor laboratory as a guide to future action throughout the country—a most worthy and desirable project in itself—the report seems excellent and should be widely publicized.

There is no good reason for delaying pollution control any longer to make further investigation and research. If there is any subject under the sun that has been investigated to death it is water pollution, and if the varied and voluminous reports of investigations that have been made by practically every state in the Union and by an unremembered number of Federal bureaus, which are now collecting dust in hidden archives, were only assembled and co-ordinated, we would have more data than we could properly digest and use during the next ten years. An obvious first step is to

The New York State College of Forestry

✦

SYRACUSE, N. Y.

Undergraduate courses of four years are offered in forestry leading to the degree of Bachelor of Science. There is also opportunity for graduate work in several branches of forestry leading to advanced degrees.

The College has ample laboratories and classrooms in William L. Bray Hall and the Louis Marshall Memorial Building. It has forest properties approximating 20,000 acres that serve for demonstration, research and instruction in forestry.

Special laboratories for instruction in wood technology, in pulp and paper-making, in kiln-drying and timber-treating and a portable sawmill are other features of this institution.

Catalog Mailed on Request
SAMUEL N. SPRING, *Dean*

Idaho School of Forestry

University of Idaho
Moscow, Idaho

Offers thorough training in technical forestry, preparing for Federal, State and private work.

Four and five year courses, leading to the degrees of Bachelor of Science in Forestry and Master of Science in Forestry respectively.

Opportunity is given to specialize in forest production, wood utilization and range management.

Large logging and milling operations, important wood-working industries and extensive Federal, State and private forests are near at hand; 7,000 acre experimental forest 15 miles from campus. Excellent opportunity for summer employment.

Catalog Free

OFFICERS

THE AMERICAN FORESTRY ASSOCIATION

President
HENRY S. GRAVES

Executive Secretary — OVID BUTLER
Treasurer — GEORGE O. VASS
Forester — G. H. COLLINGWOOD
Business Manager — FRED E. HORNADAY

Vice Presidents

MRS. H. G. BOGERT—Colorado
Chairman, Division of Conservation, General Federation of Women's Clubs

FREDERIC A. DELANO—District of Columbia
Vice Chairman, National Resources Committee

NEWTON B. DRURY—California
Secretary, Save-the-Redwoods League

ROBERT FECHNER—District of Columbia
Director, Emergency Conservation Work

MRS. WILLIAM L. HARKNESS—New York

WALTER W. HEAD—New York
President, Boy Scouts of America

MRS. EDWARD LA BUDDE—Wisconsin
Chairman of Conservation, Wisconsin Federation of Women's Clubs

IRVING H. LAROM—Wyoming
Chairman, Federal Elk Commission

MAJ. GEN. FRANK R. McCOY, U.S.A.—Ill.
Commanding General, 6th Corps Army Area

CRISPIN OGLEBAY—West Virginia
Trustee, Oglebay Institute

EDWARD A. O'NEAL, 3d—Illinois
President, American Farm Bureau Federation

LITHGOW OSBORNE—New York
Conservation Commissioner of New York

GEORGE W. PEAVY—Oregon
President, Oregon State College

ELMER GEORGE PETERSON—Utah
President, Utah Agricultural College

MISS CLAUDIA PHELPS—South Carolina
Chairman, Conservation of Natural Resources, South Carolina Federation of Women's Clubs

MRS. GEORGE D. PRATT—New York

MRS. ANNA B. SCHERER—Connecticut

DANIEL A. WALLACE—Minnesota
Editor, "The Farmer"

HENRY B. WARD—District of Columbia
Secretary, The American Association for the Advancement of Science

T. G. WOOLFORD—Georgia
President, Georgia Forestry Association

MRS. ROBERT C. WRIGHT—Pennsylvania
Chairman, Conservation and Roadsides, The Garden Club of America

Board of Directors

PHILIP W. AYRES, 1939—New Hampshire
Former Forester, Society for the Protection of New Hampshire Forests

F. W. BESLEY, 1940—Maryland
State Forester of Maryland

W. R. BROWN, 1939—New Hampshire
Chairman, N. H. Forestry Commission

P. R. CAMP, 1940—Virginia
Vice President, Camp Manufacturing Company

SAMUEL T. DANA, 1937—Michigan
School of Forestry and Conservation, University of Michigan

WILLIAM B. GREELEY, 1938—Washington
West Coast Lumbermen's Association

W. B. GREELEY, 1936—New York
Camp Fire Club of America

A. S. HOUGHTON, 1939—New York
New York State Reforestation Commission

THOMAS P. LITTLEPAGE, 1938—D. C.
Past President, D. C. Chamber of Commerce

WILLIAM S. B. McCALEB, 1936—Pennsylvania
Pennsylvania Railroad

JAMES G. K. McCLURE, JR., 1937—N. C.
President, Farmers Federation

JOHN C. MERRIAM, 1936—Dist. of Columbia
President, Carnegie Institution of Washington

WILLOUGHBY G. WALLING, 1938—Illinois

JOHN W. WATZEK, JR., 1940—Illinois
President, National Lumber Mfrs. Association

WILLIAM P. WHARTON, 1937—Massachusetts
National Association of Audubon Societies

stop the spread of the disease by preventing potential industries or new sewerage from adding to the untreated pollution load. We know that there is pollution. We know what it is. We know where it is. And, with the exception of a very limited number of trade wastes, we know how to correct it. Let us have no more stalling under the guise of further investigation and research until we have had some action on the tremendous investment we have already made in this field.

Acadia Park Enlarged

Lands totaling 266 acres recently have been conveyed by John D. Rockefeller, Jr., to the United States Government, as a part of the Acadia National Park, in Maine. At the same time it was announced that the Macon Historical Society has presented an area comprising seventy acres, to become a part of the proposed Ocmulgee National Monument, in Georgia.

Acadia National Park contains some of the most romantic scenery and majestic sea views on the Atlantic Coast, and boasts the only mountain range in the East which comes directly down to the ocean. Its popularity as a year-round scenic park is attested by last year's travel figures of 78,306.

At Ocmulgee Fields in Georgia, valuable archæological finds in recent years appear to link the prehistoric culture of its aborigines with the ancient races of the Southwest.

Wisconsin Boys and Girls Plant Pines

Sponsored by the Junior Garden Clubs of Wisconsin, with Mrs. Frank K. Quimby, of Racine, as chairman, the school children of Wisconsin have launched a five-year series of Arbor Day projects for the planting of pines within the Nicolet National Forest, in northern Wisconsin, in cooperation with the United States Forest Service and the Wisconsin Department of Conservation.

"We feel that this will be one step toward redeeming our pledge to help vitalize the recently enacted law providing for the teaching of conservation in our schools, from the grades to the university," said Mrs. Quimby. "This is an opportunity also to capitalize on this period of activity to build up public opinion so that a long-time program will come out of the emergency projects now under way."

The plan has received the approval of the State Superintendent of Public Instruction, and the Racine schools are signalized as the first in one hundred per cent enrollment.

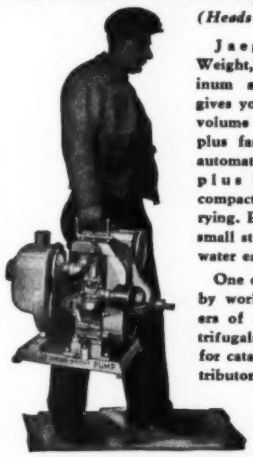
Governor LaFollette has designated May 3 to 9 as Conservation Week, and on Arbor Day each school will have a conservation program when children may bring pennies as a patriotic gesture of helpfulness. Seedling pines from the Federal nursery will be furnished the schools in order that children may visualize the plantations.

Tomasek Illinois Forester

Anton J. Tomasek has been appointed State Forester of Illinois, effective April first, succeeding Stanley S. Locke, who is now with the Soil Conservation Service in the office of the Regional Conservator at Des Moines, Iowa. State Forester Tomasek graduated in forestry from the Michigan State College in 1930 and until recently was engaged in state park work with the National Park Service as Regional Forest Technician in the Indianapolis, Indiana, office. He serves under C. F. Thompson, Director of Conservation at Springfield, Illinois.

150 GALLONS per Minute—with this Portable Automatic Priming Pump—

(Heads up to 60 ft.)



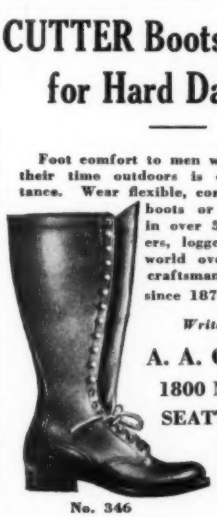
Jaeger "Bantam Weight," built of Aluminum and Alloy Steel, gives you the huge water volume of a centrifugal, plus fast, 100 per cent automatic self-priming, plus light weight and compactness for easy carrying. Passes mud, sand, small stones, pumps dirty water easily.

One of a complete line by world's largest makers of self-priming centrifugals. Write today for catalog, prices. Distributors in every city.

THE JAEGER MACHINE COMPANY
525 Dublin Avenue Columbus, Ohio

CUTTER Boots are Made for Hard Daily Use

Foot comfort to men who spend most of their time outdoors is of utmost importance. Wear flexible, comfortable CUTTER boots or pacs—hand-made in over 50 styles. Foresters, loggers, sportsmen the world over know CUTTER craftsmanship — unexcelled since 1870!



No. 346

Write for Catalog

A. A. CUTTER Co.
1800 N. 34th Street
SEATTLE, WASH.
Established 1870
formerly at
Eau Claire, Wis.

TREES pruned easily

Reforestation Projects Should Include BARTLETT EQUIPMENT
Compound Lever Tree Pruners, Pole Saws, Cross Cut Saws and Tree Surgeons' Supplies
Write for free illustrated catalog showing Complete line.
BARTLETT MANUFACTURING CO.
3019 E. Grand Blvd. Detroit, Michigan

Guide to the A.F.A. Trading Post

FOR your convenience, here is a directory of the books, miscellaneous publications and various articles for sale by The American Forestry Association. The well informed conservationist turns to this page every month.

8 BEAUTIFUL PHOTOGRAPHS OF TREES.

Prize winning pictures of specially beautiful trees of the north, south, east and west, photographed by well known artist - photographers and reproduced on heavy, dull finish paper. Each print, size 9" by 12". Ideal for framing. Set of 8 sent in library portfolio. **Price $1.00.**

CONSERVATION. A readers' digest of important articles on conservation, selected from current magazines, books and newspapers. Briefly condensed and published every other month by the A. F. A. Saves buying a great many periodicals every month, and saves the time required to read them. Keeps you abreast of the latest plans, ideas and developments throughout the entire field of conservation. **Subscription, per year, 50c.**

RANGERS OF THE SHIELD, *Forest Ranger Stories, Edited by Ovid Butler.* Thrilling adventure stories of forest fires, exciting man hunts, timber disputes, perilous encounters with wild animals, and other experiences colorfully told by men of the National Forests. 270 pages. **Price $1.50.**

YOUTH REBUILDS, *Stories from the C.C.C., Edited by Ovid Butler.* A book of personal experiences by members of the Civilian Conservation Corps picturing American youths' triumphant response to the chance to rebuild themselves. 189 pages. **Price $1.50.**

FOREST FIRE AND OTHER VERSE, *Collected and Edited by John D. Guthrie.* For those who love the out-of-doors, this collection of verse and songs brings the feeling of melody and rhythm, pathos and humor of life in the open. More than 300 well known ballads and many new poems—a thoroughly enjoyable book. 321 pages. **Price $1.50.**

TREES OF WASHINGTON, THE MAN—THE CITY, *by Erle Kauffman.* An intimate glimpse into the First President's life with trees—records that he wrote in his diary concerning his love for them. Tells also of the famous trees associated with him, particularly the trees of Washington, D. C. 90 pages; 17 illustrations. **Price $1.**

(fill in, tear out and mail)

ORDER FORM

To: The American Forestry Association

1713 K St., Washington, D.C.

Please send me the articles checked below. I enclose $..... payment.

- ☐ Portfolio of Tree Pictures ... $1.00
- ☐ Conservation, per year ..... .50
- ☐ Rangers of the Shield, *Butler* 1.50
- ☐ Youth Rebuilds, *Butler* 1.50
- ☐ Forest Fire and Other Verse, *Guthrie* 1.50
- ☐ Trees of Washington, The Man—The City, *Kauffman* .. 1.00
- ☐ A. F. A. Membership Emblem Pin ☐ Lapel Button, each 2.00
- ☐ Tree Sticks 1.00
- ☐ AMERICAN FORESTS Binder 2.50
- ☐ Association Playing Cards, *set of 2 decks* 1.00

Name.....

Street.....

City.....

State.....

Membership Emblem of The American Forestry Association. Octagon, 14 karat gold, with green enamel. Pin or lapel button. **Price $2.00.**

Tree Sticks—for measuring board feet in trees and forests. Set of 2, with instructions and carrying case. **Price $1.00**

Binder for AMERICAN FORESTS Magazine. Made of brown fabrikoid with bronze colored decoration. Holds 12 issues. **Price $2.50.**

Playing Cards, with the seal of The A. F. A. **Price $1.00** per set of two packs.

SELECT the articles you wish with full assurance of complete satisfaction. The income from the sale of every article on this page goes to aid the work of The American Forestry Association. Use the convenient order form at left.

THE AMERICAN FORESTRY ASSOCIATION

1713 K STREET, N. W. WASHINGTON, D. C.

How the A.F.A. Serves Its Members

As a member of The American Forestry Association, you are privileged to make full use of the Association's services. You will find that the services outlined below will save you time and money, give you helpful information, and more than repay you the cost of membership.

1. AMERICAN FORESTS MAGAZINE—Sent to you every month, this unique periodical is your guide to greater use and enjoyment of outdoor America. By story and picture, it provides you with information that is highly authoritative and constructively entertaining—a magazine worth keeping permanently in the library for every member of the family. Used in schools throughout the country.

2. DISCOUNT ON BOOKS—10% or more discount is allowed you on books of practically every publisher and every subject when purchased through the Association. Books are recommended for your specific requirements. The savings from this service alone repays the cost of membership.

3. FREE SERVICE OF THE ASSOCIATION'S FORESTER—to advise you in matters relating to trees and forests; what tree or shrub to plant, how to fertilize, how to prune; how to beautify your home grounds; how to treat and preserve wood; how to prevent decay and damage from insects, and similar questions will be answered free of charge through the office of the Association's Forester.

4. WASHINGTON INFORMATION AND RESEARCH SERVICE—free—to help you find the information you need relating to legislative and governmental activities, including thoroughly helpful reports for everyone interested in conservation. Also, "Forestry in Congress" reported monthly in AMERICAN FORESTS Magazine.

5. FREE TRAVEL AND RECREATION INFORMATION—to save you time, effort and money. Information on fishing and hunting; forest resorts and dude ranches; maps and road service. Aid in finding real values in sporting goods and travel equipment. This service is invaluable in aiding you to find reliable information.

6. PHOTOGRAPHIC SERVICE AND COMPETITIONS—A special service to guide you to better outdoor photographs. Cash prizes and other awards are given to those whose work is outstanding in the Association's yearly competitions. This service, without cost to you, also provides for the sale and exchange of photographs.

7. TRIPS INTO THE FOREST WILDERNESS OF AMERICA—Members are eligible to ride into the nation's remaining wilderness areas with the Association's "Trail Riders of the National Forests" on an actual cost basis. Several trips every summer, perfectly organized and equipped, and accompanied by U. S. Forest Rangers. You will long remember and benefit by the healthful enjoyment of these trips.

THESE services are for our members—to use as often as they wish. Please address all communications, including applications for membership, to the Association's headquarters in Washington. All inquiries receive prompt replies.

MEMBERSHIP

Helps to Bring These

BENEFITS

Adequate Forest Fire Protection by federal, state and other agencies.

Reforestation of Denuded Lands valuable for timber, wildlife, protection of streams.

Protection of Fish and Game and other wildlife under sound game laws.

Prevention of Soil Erosion

Preservation of Wilderness for Recreation

Establishment of State and National Forests and Parks

Development of Forestry Practices by the forest industries.

Education of the Public, especially children in respect to conservation of America's natural resources.

Forest Recreation as a growing need for the development of the nation.

APPLICATION *for* MEMBERSHIP

To: The American Forestry Assn.,
1713 K St., Washington, D. C.

I enclose $..... for the class of membership checked below.

- ☐ Subscribing, per year $4
- ☐ Contributing, per year..... 10
- ☐ Sustaining, per year 25
- ☐ Life, no further dues 100

Name.....

Street.....

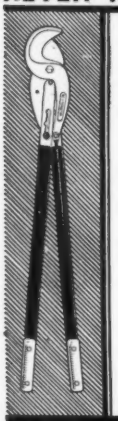
City.....

State.....

THE AMERICAN FORESTRY ASSOCIATION

1713 K STREET, N. W. WASHINGTON, D. C.

NEVER MIND THE STONES

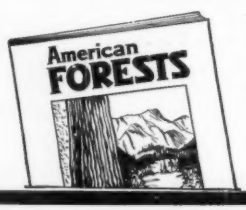


Just slip the No. 3 Forester around this two-inch trunk and cut—quickly, easily, close to ground, and leave a flat top stump. The greatest tool ever invented for brush cutting, timber clearing, roadside clearing, etc. Actually cuts 2" standing green wood—on the tree or on the ground. 34 inches long, gives good reach. Has patented slide shift power slot giving amazing multiplication of cutting pressure. Smaller sizes for pruning, cut clean and do not crush or strip bark, a feature that can only be had with tools having two sharp blades. Tempered steel jaws stay sharp.

No. 3—cuts 2" diameter green wood.....$7.00
No. 2—cuts 1½" diameter green wood..... 5.50
No. 1—cuts 1 3-16" diameter green wood.... 4.25

If your hardware dealer does not carry Porter Foresters send your order direct to us. We will fill it post paid. Please mention dealer's name. Write for circular.

H.K.PORTER, INC. EVERETT, MASS.
★★★ The Bolt Clipper People ESTAB. 50 YRS.



Back Numbers of American Forests

AMERICAN FORESTS Magazine carries each month articles by able authorities and writers and is designed to keep you abreast with what is happening in the whole field of Conservation. Accordingly we have found it practical to keep large files of back copies on hand. It is suggested that individuals, schools and libraries write us their needs and a schedule of prices will be supplied promptly.

AMERICAN FORESTS
1713 K St., N. W., Washington, D. C.

HAS WILDLIFE A SENSE OF DIRECTION?

(*Continued from page* 212)

when leaving the hive, rise backwards as though to observe their surroundings for the purpose of orientation. Older bees, on the contrary, move away with bullet-like abandon.

The insignificant ant, tumbling about in a relative jungle of grasses and debris, would seem to have a sense of direction; or how could it ever return to its colony. Some very interesting experiments have been conducted to lend a solution to this apparent mystery. Here, again, as in the case of the pigeon and the bee, the going largely determines the return. Columns of ants are guided by their antenna and olfactory processes, while individual ants effect their return through sight.

Here it would seem that the ant traveling by sight is like the untrained man of the woods, using every burned stub and rock for orientation. On the contrary, the ant is concerned more with general landmarks, and hurdles the sticks and grasses as a woodsman could cross a burning. Most species of ants are equipped with eyesight which does not register minute objects, and are concerned in their orientation with such objects as haystacks and hedges. When objects of this kind are shut out from their vision, they have difficulty in finding their way back.

The outgrowth of these scientific experiments can scarcely fail to fortify the positive viewpoint of the subject question, especially when almost daily proof of this view is encountered.

It has been shown that dogs and other animals return over familiar paths no matter how crooked, and not by a direct route. Birds wandering off their arterial highways of the air frequently become totally lost. As a rule, birds do not migrate in a straight line, but rather from bush to bush, and from stopping place to stopping place. Is it not safe then to assume that they know their geography? At least it has been quite definitely established that they have a strong faculty for remembering places. What conclusion, then, can be drawn of the sensory powers of wildlife? Is it to be assumed because experiments have not yet been concluded that some "supra-sensory-divination" takes place in the flight of a bird from the tropics to its northern range? Or is it more logical to assume that it is guided by the cues taken through its highly developed senses as named; and that as experiments move forward the nomenclature of the mystics will ultimately be dropped from the annals of the naturalist?

Type Map of Northwestern Oregon Published

Copies of a lithographed map of the northwestern quarter of Oregon showing in colors the principal forest cover types have recently been received for public distribution by the Pacific Northwest forest experiment station. The map is the first of a series covering Oregon and Washington. The series is one of the results of the forest survey of Oregon and Washington, upon which a force of field and office technicians has been engaged for several years.

The maps can be obtained at 423 United States Court House, Main and Sixth, Portland, for $1.00 a copy. An additional charge of 10c will be made for mailing from 1 to 5 copies. For more than five copies an additional charge of twenty cents will be made. Remittance should be by cash, certified check or money order payable to the Regional Fiscal Agent.

WHO'S WHO
Among the Authors in This Issue

GRIF ALEXANDER (*Springtime*) lives in California, Maryland, where for the past few years he has been an "amateur gardener and woodsman." He was formerly a reporter and special writer for the Pittsburgh *Dispatch* and later an editorial writer and columnist for the Philadelphia *Public Ledger*.

Cora C. Whitley

MRS. FRANCIS E. WHITLEY (*The Outlook for the Wild Flowers*), of Webster City, Iowa, is chairman of the Iowa Federation of Women's Clubs. For many years she has found her chief interests, outside her home, in conservation and child welfare. When she was president of the State Federation of Women's Clubs, from 1915 to 1917, Mrs. Whitley was influential in the creation of state parks in Iowa, of which more than forty have been established. Nationally known for her many splendid conservation activities, Mrs. Whitley has served as a director of the Izaak Walton League of America and as a vice-president of The American Forestry Association.

SAM MIMS (*Lot's Wife Looked Back*), lives in Homer, Louisiana, where he is assistant project manager, Division of Land Utilization, Resettlement Administration.

CRISTEL HASTINGS (*The Jeweled Forests of Arizona*), a native of California, has written extensively about the natural beauties of the West.

KENNETH A. REID (*The Control of Stream Pollution*), of Connellsville, Pennsylvania, is a member of the Pennsylvania Board of Fish Commissioners, a National Director of the Izaak Walton League, and a member of the Dern-Lonergan National Stream Purification Conference. He is well known as a writer for outdoor magazines, and for several years conducted the angling department of the *National Sportsman*. Mr. Reid initiated and carried to a successful conclusion a movement to obtain federal funds for sealing abandoned coal mines,—an important step in the control of stream pollution.

CALVIN RUTSTRUM (*Has Wildlife A Sense of Direction?*) needs no introduction to readers of AMERICAN FORESTS. He lives in Minneapolis, where he specializes in criminal investigation work.

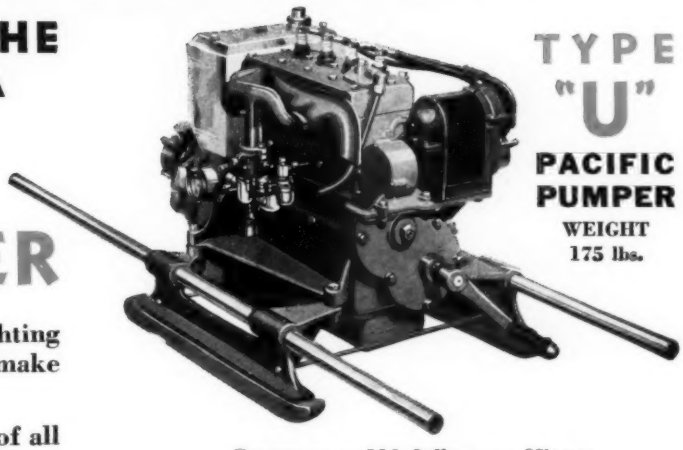
MARY CARPENTER KELLEY (*Saving the Sugar Orchard*) is a native of the White Mountain region of New Hampshire and a descendant of one of the old pioneering families. She makes her home in Alfred, Maine.

A. A. BROWN (*Planning Fire Lookouts in California*), silviculturist at the California Forest and Range Experiment Station located at the University of California, was graduated from the University of Michigan with a B.S. degree and entered the Forest Service in 1922.

ERLE KAUFFMAN ("*The Elm—America's Tree of Glory*") is assistant editor of AMERICAN FORESTS. G. H. COLLINGWOOD (*Forestry in Congress*) is forester for The American Forestry Association.

BE PREPARED FOR THE EMERGENCY WITH A

PACIFIC *Portable* PUMPER



TYPE "U" PACIFIC PUMPER
WEIGHT 175 lbs.

These powerful, dependable fire-fighting units are the best investment you can make in emergency protection.

They have the highest *weight efficiency* of all portable pumpers — more power with less weight—more easily transported — greater protection over a wider area. Approved by every forestry and conservation organization in America. Thousands of these pumpers are in service today, ready to go into instant action against spot fires in forests, ready to protect isolated homes, ranches, communities, trestles, bridges, snow-sheds and other property subject to fire hazard. Five models to fit every need.

Send for illustrated literature describing each model separately.

Pumps up to 110 Gallons per Minute
Pressures up to 250 lbs.

4 OTHER MODELS FOR EVERY EMERGENCY NEED

•

PACIFIC *Pacolized* LINEN HOSE

Weighs only 13 lbs. to the 100 feet. Proof against mildew. Can't rot. This hose was developed by us to meet the exacting needs of forest fire fighters who must have absolutely dependable light weight hose.

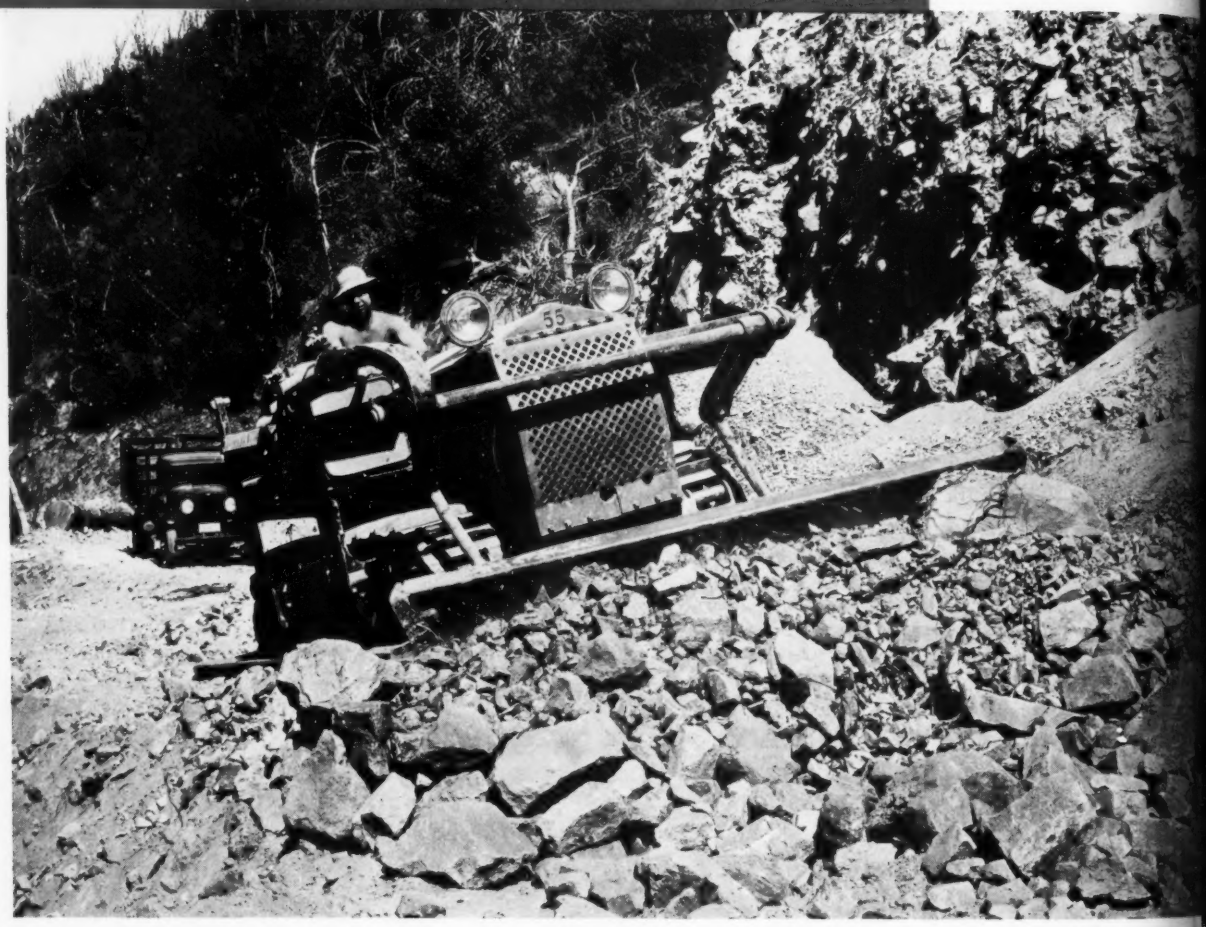
Send for Special Literature describing this remarkable hose.

Manufactured in Seattle, U. S. A., by

PACIFIC MARINE SUPPLY COMPANY

LARGEST MANUFACTURERS AND DISTRIBUTORS OF PORTABLE FIRE FIGHTING EQUIPMENT AND ACCESSORIES IN AMERICA

CLETRACS in the FOREST SERVICE



IN Region No. 3 of the United States Forest Service, embracing eight National Forests in Arizona and six in New Mexico, trailbuilding and dam construction for reservoirs are major activities. Most of the Cletracs in Region No. 3 are 55's, all of them equipped with bulldozers but also used with rippers and graders for clearing and trailbuilding and with rotary fresnoes for making earth fill dams.

As in other forest service, public and private, Cletrac power and stamina and the exclusive Cletrac controlled differential steering have made Cletrac preferred tractor equipment of experienced foresters.

Cletrac builds a complete line of crawler tractors, three of which are Diesel Powered, with a range from 26.2 to 93 h.p., meeting every crawler tractor need. Write for literature.

Cletrac
Crawler Tractors
Built To Endure
REG. U.S. PAT. OFF.

THE CLEVELAND TRACTOR CO. • Cleveland, Ohio